SEPTEMBER, 1922

THE MINING CONGRESS JOURNAL

VOLUME 8 NUMBER 9

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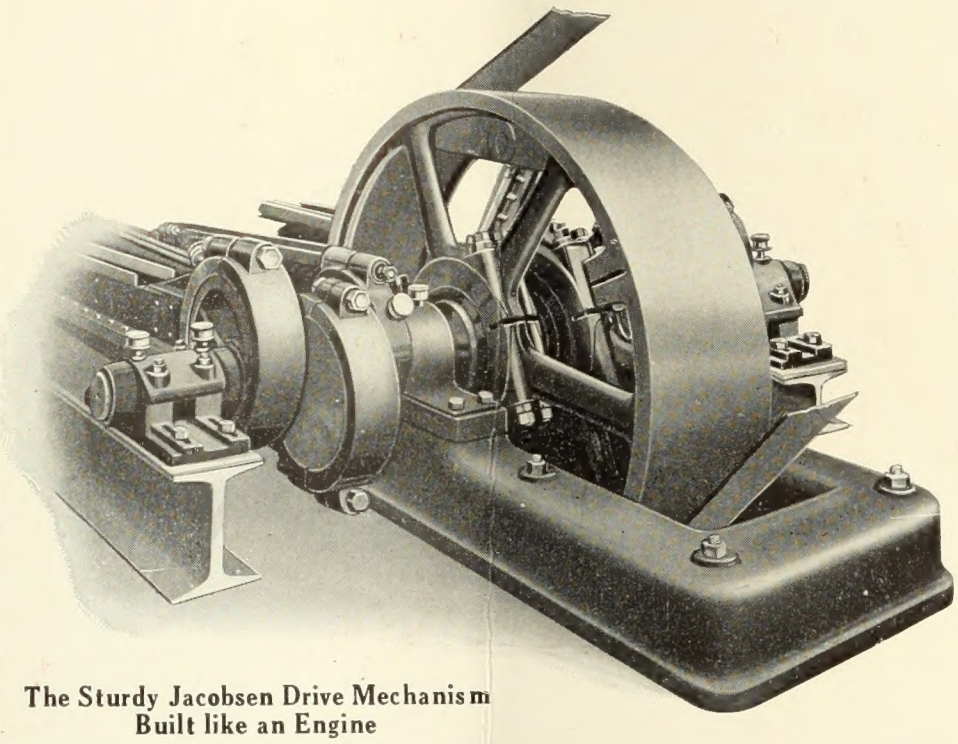

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THE MINING CONGRESS JOURNAL

SEPTEMBER, 1922

CONTENTS

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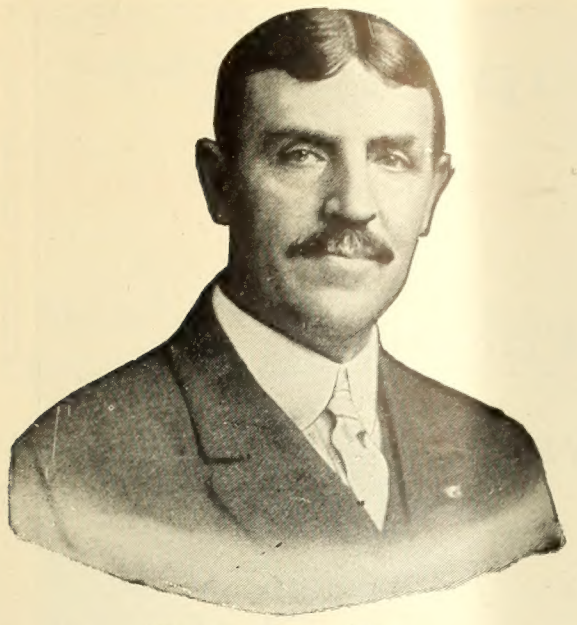

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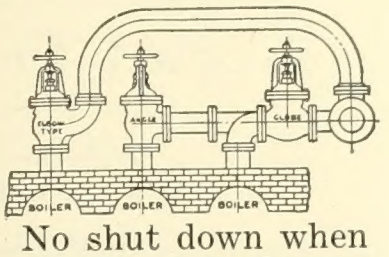
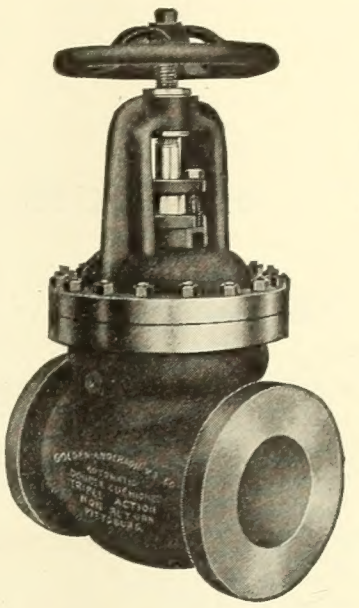


No shut down when a boiler tube bursts



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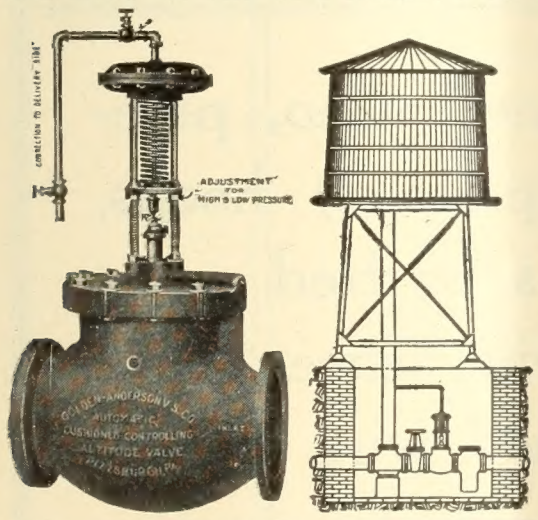

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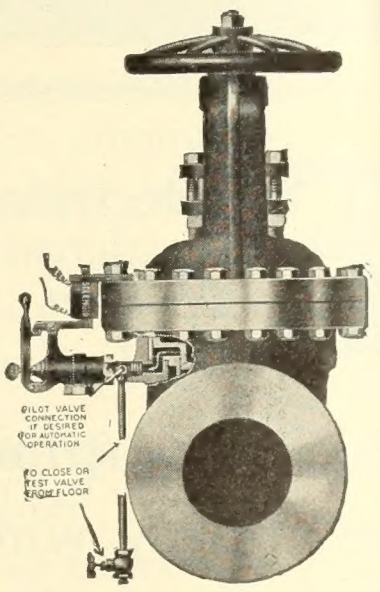

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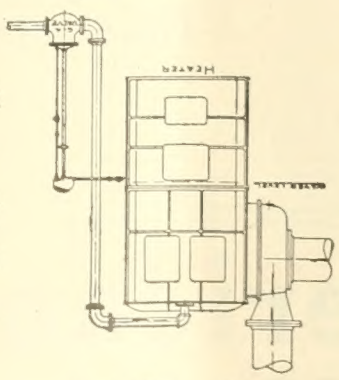

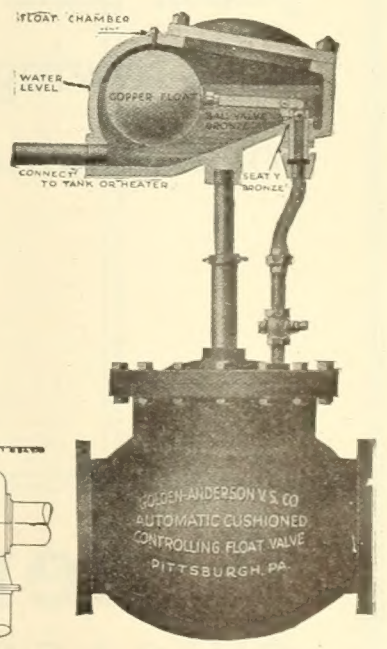

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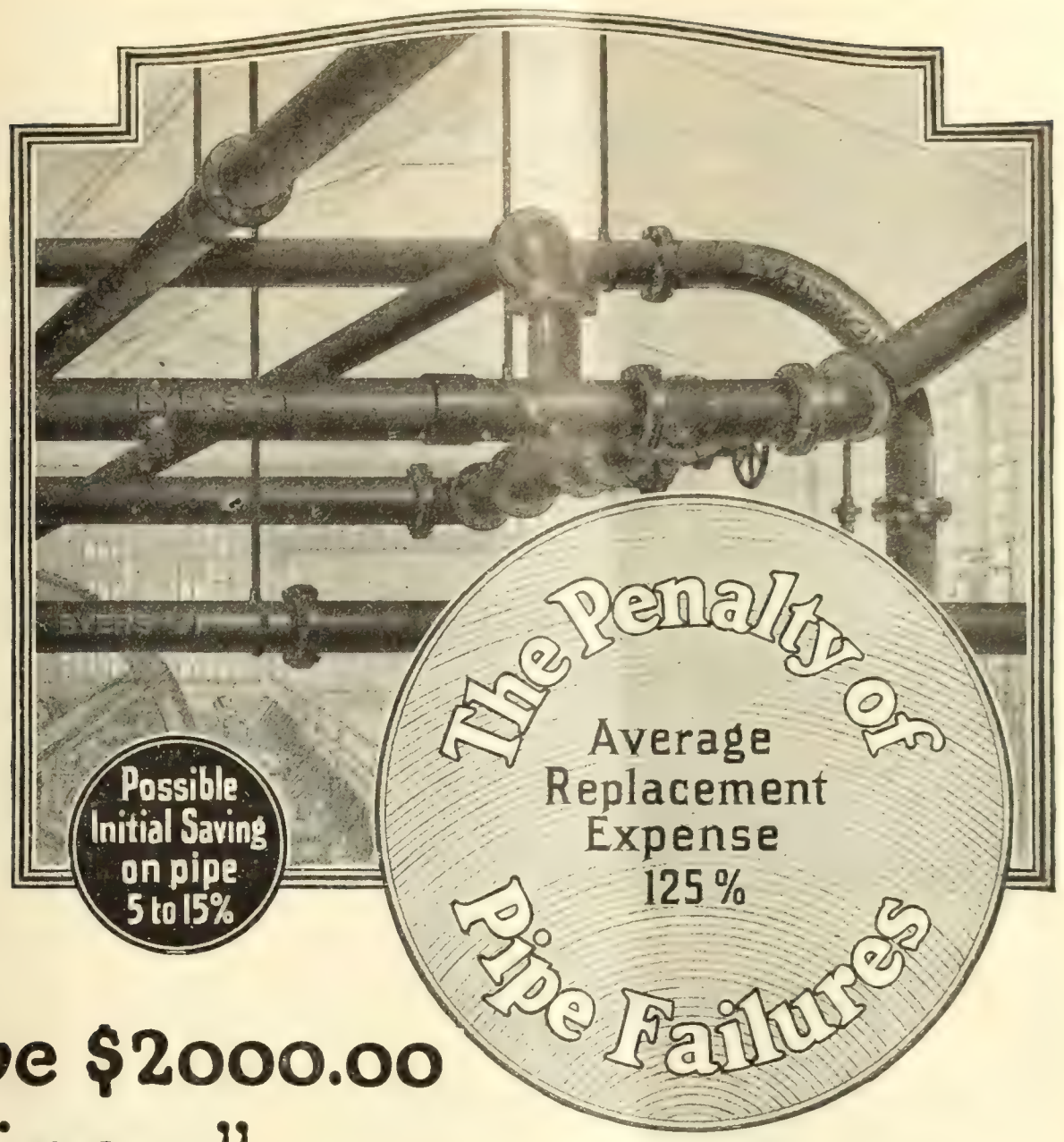

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THE AMERICAN MINING CONGRESS

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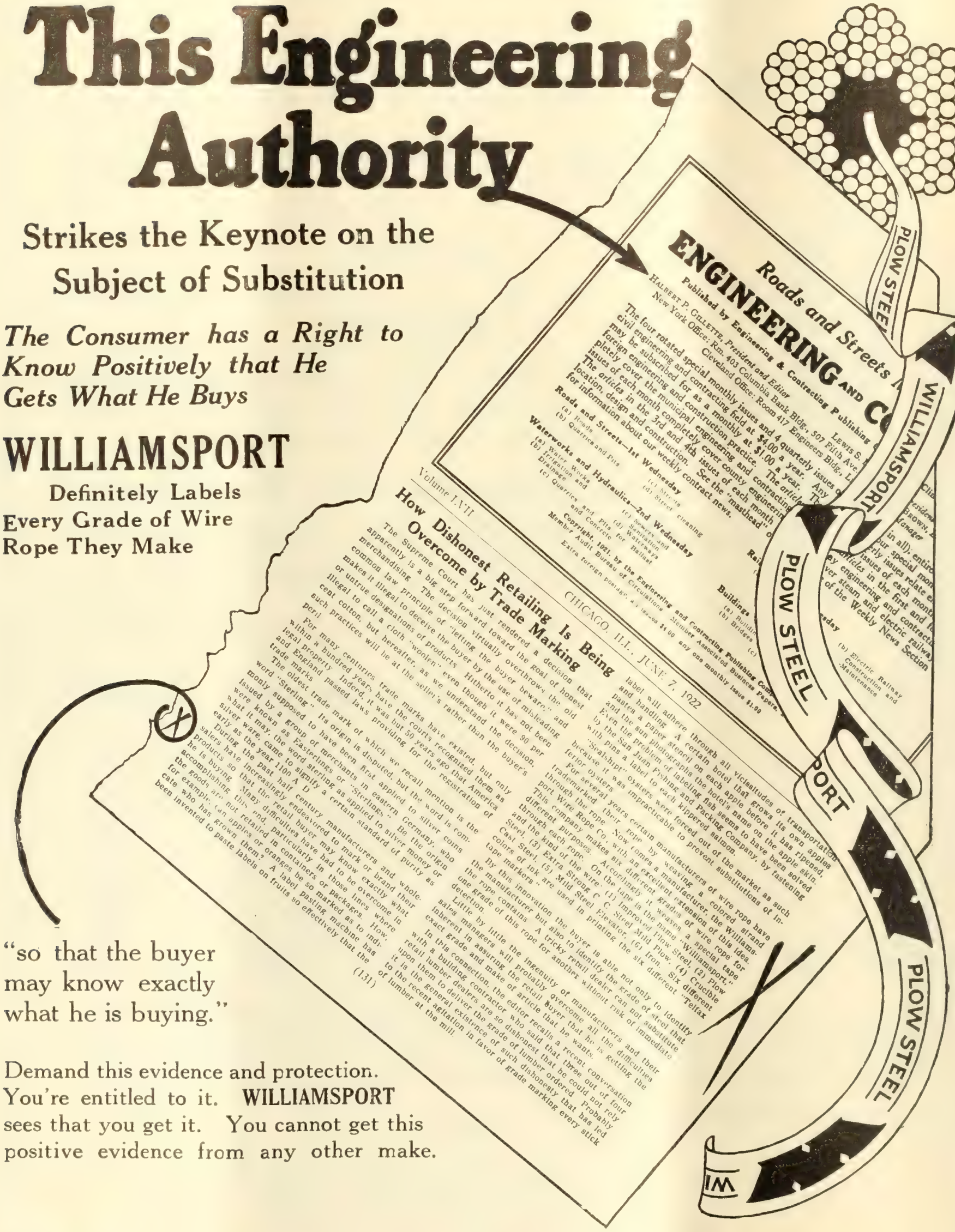

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THE ALLIED WAR DEBT

LEADING NEW YORK bankers have expressed a decided belief that the allied war debt owing to the United States should be cancelled as a necessary step in the stabilization of European finances. It is urged that some adjustment of international debts "will soon be necessary not only in the interest of national solvency abroad but of national prosperity in the United States." It is frequently urged that France and Great Britain cannot forgive the debt which Germany owes to them unless the United States will be equally generous and that Germany can never get on her feet financially except by the cancellation of the reparations which were agreed upon. This last argument produces an additional reason to the many other valid reasons why the allied debt should not be cancelled.

Germany's financial conditions are not the result of real poverty but more the result of bad statesmanship. Its financial leaders have undertaken to pay their local debts with paper money and the continually increasing issue of the German mark has naturally and necessarily reduced its value to almost less than nothing. From a financial standpoint, Germany is bankrupt. Her bankruptcy had better be declared. Her internal debts can never be paid. Her reparation obligations are preferred claims which must be paid before those manufactured obligations which have resulted in the depreciated value of her currency.

A business concern finding itself bankrupt makes assignment for the benefit of its creditors, its preferred creditors being first paid, and, if there is nothing left after these payments the ordinary creditor's claim is cancelled by virtue of a bankruptcy law. No claim against a country is entitled to greater preference than the reparations agreed upon on account of a war for which that country is entirely responsible and which reparations do not begin to measure the damage occasioned to other countries by virtue of her criminal acts.

Every report from Germany indicates that business is going on as usual. People are employed, production is at a high point, and, aside from the fact that Germany's currency system has no gold basis, Germany is in a prosperous condition. Recent observers in France and Belgium report that the fields devastated by the conflict of war are now in a state of full production and that little evidence of the war's devastation is now to be seen. The productive power of Germany is nearer par than that of any other European nation. Her productive machinery was less impaired by war than that of any other nation. Her people are thrifty, prudent and industrious. Germany will be the first of the nations of the world to recover from the effects of the war. Already her manufactured articles are filling the world's markets at prices which cannot be met with high-priced union-controlled labor.

Only the greed of our domestic merchandizing agencies prevents the utter demoralization of our manufacturing industries. If German manufacturers were to receive one-half the prices which are paid by the American consumers Germany would shortly be able to meet all of her reparation demands. This merchandizing greed is hiding its iniquity behind what it denominates as a robber tariff. Opposition to a protective tariff by interested parties would be entirely dissipated in the public mind if it were known that these same merchandizing agencies are making profits which vary from 100 to 500 percent.

It is high time that this country forgot its irrational sympathy for the poor German and refuse to further temporize with the world's great bluffer, and it is high time the world got behind France, who knows the German people better than any other nation, and gave support and encouragement to the plans of France which insist upon the full payment of German obligations. No one can have continued confidence in Germany. Germany has no right to expect other nations to accept her statements.

If the reparations are not forthcoming, let France proceed to collect her claims by the only processes which are open, and let us not forget that there can be no assurance of future world peace unless Germany is kept in poverty and so supervised that war preparations cannot be made. Let the world take advantage of the bitter lesson which France has learned by experience.

SENIORITY RIGHTS AND PENSION PRIVILEGES

JUDGING BY the pertinacity with which the striking shopmen are fighting to regain the seniority rights lost by going on strike, it would seem that the forfeiture of some vastly important right is concerned and the public has received the impression that the forfeiture of accumulated pension privileges is involved. On most, if not upon all railroads the seniority rights and pension privileges are entirely separate matters. Pension rights depend upon the number of years of service whether continuous or not. Seniority rights depend upon continuous service.

Aside from the injustice involved in the violation of contracts entered into by the railroads with their present employees and the punishment to these men for refusing to quit the service according to the strike order, it would seem that the issue involved is hardly worth consideration. As a matter of fact, the real issue is control, not seniority. Control of industry by organized labor is not possible so long as the right of others to work at the job deserted by the strikers is maintained. This furnishes an additional reason why the railroads, in defense of the public interest, should resist the men who are willing to sacrifice the country's interest ostensibly for a seniority privilege which is comparatively of such small importance.

THE ISSUES vs. THE MOVEMENT

IN DEALING with the coal strike, we must not allow ourselves to become confused by so simple a matter as terminology. We all speak glibly of the "issues" in the strike and then of "the labor movement." We allow ourselves to be lulled into the soft belief that the labor movement is merely a means adopted to enforce the dissolution of the issues in a way satisfactory to the miners' union.

The "issue" in the World War was the assassination of an insignificant grand duke at Sarajevo. The "movement" was the attempt to establish the world-wide supremacy of the German Empire. Before the first Belgian fort had been reduced, the issue had disappeared; the movement had become paramount. In that case, we were all sufficiently discriminating to disregard the "issue" and to recognize the "movement."

In the coal mine strike—now drawing to an inconclusive pause—the "issue" was the retention, for a time, of the war-time wages of the miners. We have all been so blinded by our passions over the "issue" we have not seen the "movement" which is but poorly masked behind it. Indeed the Shibboleth of the "movement" is so cleverly commingled with the declaration of the "issue" we have not been sufficiently discerning to separate one from the other.

The "issue" in the coal strike is a mere matter of dollars and cents—whether one group will get them or whether another group will keep them. If that were all that is involved, the whole dispute could and would go to arbitration. Disputes over dollars and cents always have gone and always will go to court. And, going to court is nothing but agreeing to arbitration.

When the miners' union refuses arbitration, it puts the "movement" ahead of the "issue." That compels us to inquire into and to shift our thoughts to the "movement" if we want to understand this thing.

The labor "movement" in coal involves these many things:

First—The miners' union wants a monopoly of the right to work in coal mines. That is the beginning and the means to the end.

Second—The miners' union wants the unlimited check-off. That is the method of financing the existing union and the campaign necessary to carry the union to a coal labor monopoly.

Third—The miners' union has come, through various stages, to demand in its constitution "the full social value of a ton of coal." This it defines as "the selling price to the consumer less the freight rate." It wants to confiscate the capital invested in coal mines. As early as 1912, it had demanded that, ultimately, the mines must be turned over to the miners to be worked on a cooperative basis.

Fourth—The miners' union demands the nationalization of the coal mines. This is generally understood to mean the declaration by the state that coal is a common possession to be administered by the government in the joint interest of capital and labor.

Fifth and Final—The miners' union demands national agreements. This means that all contracts with all mine labor shall be made on the same date and shall expire on the same date.

The miners' union resists arbitration because, as Mr. Lewis has just said, that would mean an end to collective bargaining. Collective bargaining, on a nation-wide scale, means the right to strike on a nation-wide scale. By employing the nation-wide strike periodically against a politically-controlled industry, the leaders of the miners rather shrewdly assume that they, with their vast voting strength, will be the final and complete masters of that industry. And, by these methods they will acquire an industry without paying a cent for it.

That, in the essence, is the "labor movement" in coal. We are not safe if we ignore it to pay attention exclusively to the "issues" which, in this case, are insignificant things.

INDUSTRIAL COURTS

THE FIRST DUTY of government is to protect its citizens in their legal rights. Where such rights are in question, courts have been established by which a judicial determination of the issue might be made and which would be binding upon both of the contesting parties. For many years this government so functioned as to require that all disputes which might affect the public peace should be judicially determined, and the man who undertook to settle his own troubles by force was regarded as a disturber of the public peace and properly punished for his offense.

The development of labor organization has introduced into our national life new kinds of disputes which seem not to be subject to public control or determination. The growing protest against disputes which are settled by force and a continuing demand that the public peace should not be disturbed by disputes of this character has led organized labor to continuous protest against compulsory arbitration. Upon the other hand, there has been a continual demand and a continuing effort to bring about the creation of some settled means for the determination of these conflicts.

The first outstanding effort in this direction resulted in the Canadian Industrial Disputes Act which has been regarded as a model in the framing of very much of subsequent legislation. Two outstanding results of this effort are the Colorado Industrial Commission Law and the Kansas Industrial Court Law. The Kansas law has been so much discussed in the public that it will not be necessary here to outline its provisions.

The important features of the Colorado law are as follows:

"It shall be unlawful for any employer to declare or cause a lockout, or for any employe to go on strike, on account of any dispute prior to or during an investigation, hearing, or arbitration of such dispute by a commission, or the boards under the provisions of this act; * * *"

"Provided that nothing in this act shall be held to restrain any employer from declaring a lockout, or any employe from going on strikes in respect to any dispute after the same has been duly investigated, heard, or arbitrated, under the provisions of this act."

"Nothing in this act shall be construed to make any finding, determination of the rights of said parties, decision or award of said commission or of any board of arbitration appointed thereby upon the facts of such controversy, binding, conclusive or enforcible upon any of the parties thereto, or affected thereby, unless such parties have agreed in writing prior to the commencement of such investigation, etc., and unless said parties shall agree to accept and be bound by such action of the commission."

These provisions do not seem to justify the bitter opposition which has been raised by organized labor against the carrying out of its provisions. The law applies with equal power to employer and to employee. The law applies with more force to the employer than to the employee. It has been charged that the law makes industrial slavery effective. As a matter of fact, this is not true. The individual workman may quit at any time, but it does stipulate that a strike, i. e., a concerted quitting of work by all employees under the orders of the superior officers of their organization, is prohibited until such time as an investigation may be made of the alleged causes for strike. As soon as this investigation is made

(and a later provision requires that the investigation shall be made with as little delay as possible) employees may strike or the employer may declare a lockout.

No strike has ever been won which did not have the sympathy of the public. The purpose of the investigation is merely that the public may have advice as to what the causes of dissension are and the natural effect is that the parties having a little time to consider the matter are less likely to take hasty action. The operation of the law has not been as satisfactory as might have been wished, but on the whole and in consideration of the bitter opposition to its provisions on the part of organized labor, it has been more than successful.

The present labor convulsion clearly indicates the necessity for laws which will protect the public interests. That party to an industrial controversy not willing to leave its case to a judicial tribunal is not entitled to public sympathy. Exact justice may not always be secured in the courts, but there has been no method yet devised through which more exact justice can be secured. Certainly justice is not the result of the settlement of industrial disputes by strikes and lockouts. By this method, no matter which side wins, both lose. The nation at large is always the greater loser.

The MINING CONGRESS JOURNAL believes that the time is ripe for a concerted movement looking to the establishment of industrial courts before which every industrial dispute in which any considerable number of men are involved shall be adjudicated. It is not contended that the right of an individual to cease work shall be disputed, or that any infringement upon the individual rights shall be considered, but it is contended that any action carried out under the direction of a labor organization and every concerted action on the part of the employer with relation to changed conditions of wages or employment, may be taken to such court for final determination. The MINING CONGRESS JOURNAL will welcome suggestions from its readers as to whether the course outlined meets approval or otherwise.

WHAT IT'S ALL ABOUT

THE PUBLIC has been puzzled to know why the apparently unimportant question of seniority should justify the continued idleness of thousands of men upon the one side and the very serious public menace of a discontinuance of railway transportation upon the other; why it is that trains should be dynamited in New Jersey and abandoned in Arizona; why workmen should be assaulted here and murdered there, when only the question of precedence in promotion was involved.

Mr. L. E. Sheppard, president of the Order of Railway Conductors, fully explains the issue. In reply to an inquiry as to the attitude of President Harding, Mr. Sheppard says:

"Oh, no! The President has been fair and has been of help in the situation in every way possible. What we now hope for is the getting of help from some railway executives not so tenacious as others to see that *it is the fundamental right of men to strike that is involved,* rather than seniority.

"The Railroad Labor Board says that men on strike no longer are employees. We hold, and many good lawyers hold with us that men do not forfeit their rights *when they go on a legal strike.*"

Thus the bluff of the strikers is unmasked. The real issue is the right to strike without suffering any of the penalties which naturally follow. Employers may take their injury without redress. The public may pay its penalty of suffering and loss, but he who causes the loss of all parties insists that he alone shall escape the penalty of his own act. The doctrine of the right to strike has been urged so long and so vociferously and by those who have confused the issue with the right to quit work that it is but natural that escape from all penalties should now be urged. The fact is that *the right of a number of workmen to quit by mutual agreement for the purpose of coercion is a conspiracy and not a right* and the issue of priority is being made to further *entrench those who claim as a right what is in fact a conspiracy.*

SOUND MONEY

THE ADVOCATES of sound money have, in all times, been forced to defend their position against the antagonism of those who believe that cheap, unsound money can perform the function of money supported by a metallic base. Even the lessons of Austria, Germany and Russia do not seem to convince the opponents of the gold standard, probably because they have not come in contact with the actual working of the paper money system.

A year of actual residence in Russia taught Emma Goldman more of the advantages of stable government than she had learned in this country during a lifetime. Mr. Henry Ford's proposal that a part of our currency might well be based upon the undeveloped power of the Tennessee River would scarcely be accepted as applied to the River Volga if such money were to be offered in consideration for the output of the Detroit manufacturer's automobile establishment. A recent issue of Mr. Ford's *Dearborn Independent* gives the following advice:

"Don't dam up the stream of prosperity because your gold outlet is too small to let the stream run through. Make other openings. Which attitude is the most fanatical? Fanatics are those who cannot see over their bags of bullion. They are worshipping a dead pagan. They are placing their whole dependence on the most useless metal in the world. If that is not fanaticism, it would be impossible to describe what fanaticism is."

And the argument proceeds that because there are "some millions of people in the United States who never saw a gold dollar" that the people are off the gold basis "as clearly as if they had never been on it." The fact is, however, that the real value of our own paper money is based upon the confidence which the people have that it may, if required, be redeemed in gold. Russia as a territory is undoubtedly possessed of greater wealth today than ever before, and yet its guarantee of the money which it has issued is not accepted by the public and, because of that lack of confidence that this paper money can be redeemed in gold, is practically valueless.

Why is not the money of Russia, Germany and Austria worth its face as is the money of the United States? Simply and only because one has a proper backing and the other has not. All of them have the guarantees of great governments and yet something more than this is required to justify the confidence of the people.

It is true that the world's supply of gold is not growing in proportion to the volume of business. It is true that a higher price level on commodities makes necessary an increasing amount of money to carry on its business transactions. It is true that the unequalled distribution of the world's gold supply will make extremely difficult the return to normal conditions in those countries where gold is scarce. It is true that next to gold, silver has been recognized throughout the ages as the next best representative of money value.

Under these conditions, it would seem wise that those countries which cannot supply themselves with gold should utilize the available world's supply of silver at least for subsidiary coinage. The use of enough silver

to meet the ordinary requirements of business life of those nations which are now entirely upon a paper basis, would create such a demand for silver as to make its value on a gold basis sufficient to justify the confidence of the public that it would not lose its value as a medium of exchange.

If these statements are true, then it would behoove the silver countries of the world to make possible the use of surplus silver by those countries which need a metallic money medium and which are unable to obtain sufficient gold.

MISGUIDED FINANCIAL AUTOCRATS

IF ALL of the efforts to prevent men from working made by the friends of organized labor, which result in verbal or physical interference, many times to bodily injury and frequently to murder, could be catalogued, the list would be appalling to the American people. All of these outrages are being committed in order that organized labor may starve the nation into an acceptance of the terms which it proposes.

In the face of these outrages, it is somewhat amusing to note the statement by Samuel Gompers that:

"The misguided financial autocrats are inspired along the line that might is right and they brush aside ruthlessly any suggestions based on the theories of liberty, justice, charity and humanity." "The invisible super-government of Wall Street," says Mr. Gompers, "is standing out against all compromise in the coal and rail strikes, believing the time is at hand for giving labor its death blow." And therefore Mr. Gompers concludes, "that the one purpose of these sinister forces of financial giants is to place labor in a false light before the great American public."

The fact is, that if the attitude of labor could be fully understood by the great American public, organized labor as it now functions would be effectually and finally dealt with. If the words "organized labor" could be substituted for the words "misguided financial autocrats" in the statement as Mr. Gompers makes it, it would more clearly define the actual situation. A careful analysis of Mr. Gompers words is convincing.

"Every railroad man and miner," says Mr. Gompers, "striking in protest against intolerable conditions, is inspired by the knowledge that he is fighting an economic battle for an American principle and he is deserving of the public sympathy. *Meanwhile the public may rest assured that the acute fuel famine will continue to exist until these hordes of practical workers, organized for their personal welfare, will have voluntarily returned to their jobs.*"

The situation is very simple and the great American public can easily understand it. The United Mine Workers, with Mr. Gomper's endorsement and approval laid down the law to the American people, enforcing it by "an acute fuel famine" which is to continue until the terms of this union are met, and until that time the autocratic invisible super-government of organized labor will continue to exercise control over the situation. This effective law was not passed by Congress, it is the edict of organized labor. Congress has no right to prevent any man from doing a lawful thing. Organized labor assumes the right to prevent "scabs" from undertaking the work which it refuses to do. When the provisions of the Constitution of the United States are made fully effective, "organized industrial autocrats" will cease to function as a controlling factor in American life.

MISTAKEN ZEAL

IN THE DISCUSSION of the railway shopmen's strike it is somewhat surprising that the most controlling reason why seniorities should not be returned to the strikers has been entirely overlooked.

The Constitution of the United States regards the sanctity of contract even more highly than the right to private property; it not only upholds the virtue of contracts but expressly prohibits the enactment by any state of any law "impairing the obligation of contracts." While it upholds the right to private property it permits private property to be taken by "due process of law," but it provides no excuse or authority for impairing the obligation of a contract. Whether the government itself has the right by congressional action to impair the obligation of any contract is a matter of grave question.

Refusal to accept the administration's proposal to take from those employees who remained loyal and continued at their work and from those new employees whose service has made possible a continuance of transportation service to the public was the plain duty of the railway management. Railway managers were bound to protect the contracts made by them with their faithful employees by every principle of honor, by every requirement of public duty and by the most sacred requirement of the Constitution, and yet—a mistaken zeal for the public good requests this open violation of business ethics, law and the Constitution to meet the demand of an organization which carries in its other hand the threat that unless its demands are met that through force it will throttle the business life of the nation and inferentially treat as "common strike-breakers" the faithful employees, the sacrifice of whose rights is demanded.

The Herrin lesson is still fresh in mind. All employees who have taken the chance of similar treatment have added that risk to the service contracted for in consideration of the seniority right of service which railway executives contracted to give them.

These rights are supreme—they must not be abrogated. The faithful employees who make railway service possible are entitled by every principle of ethics, justice and Constitutional authority to be protected in their right to life, liberty and the pursuit of happiness, and they are particularly entitled to that right for which they accept the risks of lawlessness and brave the terror of a new Herrin.

ALASKA'S COAL LAW

ONCE AN IDEA is imbedded in the mass mind of the public it persists in remaining in its position. That is why some people still may be heard reciting the charge that the natural resources of Alaska are being turned over to "big interests" at the expense of the nation.

Never more than a casual thought has been required to bring forth this wail in its true light, which approaches the ridiculous. Recent events connected with development of the Alaskan coal fields should, therefore, emphasize facts so that they never again will be misinterpreted.

For years a misguided school of thought has bent its every effort in seeking to convince the nation that the "vast coal deposits of Alaska" were well on their way to monopolization by the "lords of the coal industry."

Now comes the broadcasting of a fact long recognized by the more rational of folk, which shows that business men will not undertake the development of Alaska's coal deposits under the provisions of the Federal Leasing law, simply because such development under the conditions imposed would prove operation unprofitable.

STRIKE ROUSES COAL INVESTIGATION SPIRIT

Commission Authorized At President's Request—Government Already Possesses Mass of Coal Information—Efforts for "Permanent Settlement" Must Conform With Law of Nature—Price-Fixing Control Opposed

BY IRA L. SMITH

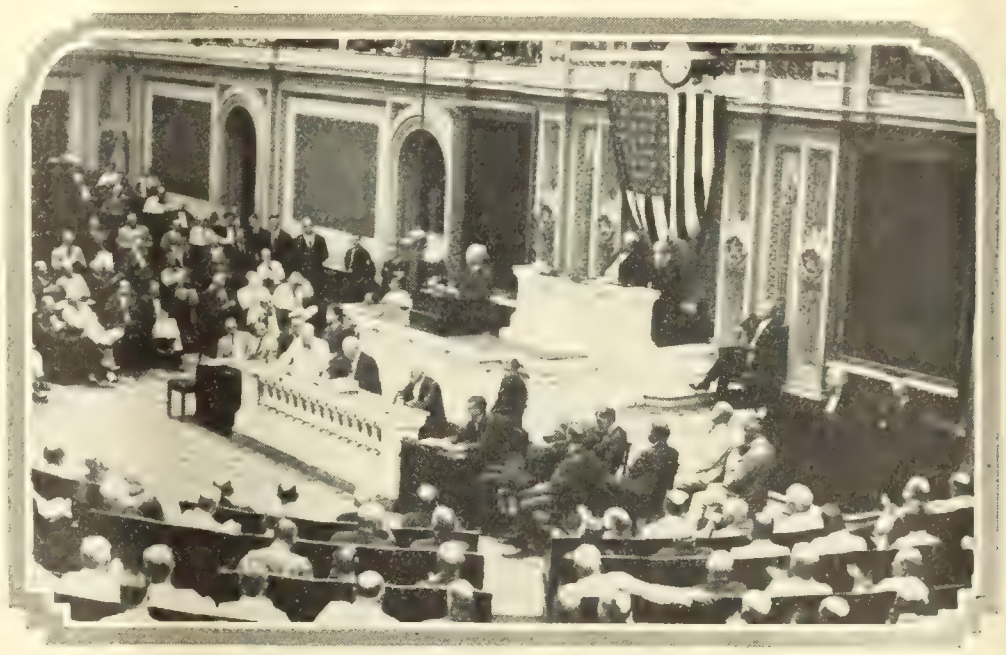
THE SPIRIT of a federal coal investigation is stalking abroad in Washington, having been roused by the strike from the resting place it has occupied since Calder, Frelinghuysen, et al., failed in their efforts to secure enactment of a coal regulation bill.

Scarcely had the President uttered his request for authority to establish a fact-finding commission before Congressional leaders busied themselves in efforts to speed enactment of legislation for that purpose. It immediately was predicted that the proposal would gain approval at an early date, since little major opposition to it was expressed among the legislators.

The fact-finding legislation entered upon its first phase of progress toward enactment when Chairman Winslow of the House Committee on Interstate and Foreign Commerce introduced a bill to create the commission, having conferred with the President in connection with details of the measure. The bill calls for appointment by the President of a commission of not to exceed nine members with directions to make a report to the Chief Executive and Congress by January 1 next. It passed the House August 23.

Included in the wide range of investigative power proposed for the committee is the right to make inquiry into the books and transactions of various coal producing companies. It is a questioning of this right which has embodied the main expressions of criticisms directed against the measure. Cases now are pending in the courts in which the legality of this right forms the issue of contention. A preliminary injunction was issued many months ago by the District of Columbia Supreme Court prohibiting the government from examining books containing cost data. The cases of the Maynard Coal Company and the Claire Furnace Company, in which this issue predominates, are now pending before the District of Columbia Court of Appeals where they have been carried by the Federal Trade Commission.

Close students of the situation who examined the proposed coal legislation carefully at the time of its introduction, professed to see a necessity for modification of its proposal to grant the authority to delve into the cost books of coal companies. They pointed out that the fact that the courts already have held this practice to be in violation of the law renders any proposal unwise which seeks to incorporate cost-finding plan in the Winslow bill. By treading upon this doubtful ground it is said the government weakens its fact-finding campaign.



INDUSTRIAL STRIFE IS PRESIDENT'S SUBJECT

In addressing members of Congress assembled in joint session August 18, President Harding outlined events leading to the industrial crisis induced by the coal and rail strikes. He told the legislators the fact has been revealed that "except for such coal as comes from the districts worked by non-organized miners, the country is at the mercy of the United Mine Workers"

The administration's plan to establish a federal agency through which the government would enter into the coal business to the extent of buying, selling and distributing the product for the purpose of holding down coal prices, will not be acted upon during the present session, according to indications drawn from the amount of opposition already voiced against it.

Members of Congress who have expressed themselves as adverse to enactment of legislation proposing that the government must engage itself in the coal business, based their objections mainly upon the point that the bill would have to be rushed without receiving careful consideration if it were to accomplish any good in the present crisis with which it is primarily intended to deal. The government's relationships with business already are too complicated, many claim, and no judgment can be seen in pushing legislation of this magnitude through Congress at a speed that would deprive it of the careful consideration which its character demands.

In making recommendations that these two federal agencies be established by the government, President Harding took his first step in an effort to accomplish a permanent solution of a problem that never will be solved until labor recognizes the law of supply and demand and agrees to accept wages and working conditions that at least approach the dictates made by the economic laws which govern all industry. Though he made the best move open to him, President Harding cannot hope to achieve success in an effort to legislate the kinks out of the coal industry.

All hopes to purge the coal industry of its labor troubles must wait for their realization until such time as the industry is rendered economically sound. It cannot be sound so long as the miners refuse to accept liquidation of their war-time wages and insist upon holding out demands that cannot be justified upon any ground but that of selfishness. So long as these conditions exist all efforts seeking to enact corrective legislation are false moves. Even the proposal to investigate the coal industry can gain but little if it is followed through, for enough facts of this type were developed during the last three years alone to satisfy even the most curious and investigative of minds. Many volumes of testimony taken before congressional committees standing as mute evidence that they have been marshalled by commanding voices.

Conditions have not changed since this host of data was gathered and it could be taken almost bodily and its application to the industry at any time close to the present would develop few irrelevancies or inaccurances.

Production, working time, cost, wages, transportation rates, storage, and on

and on—all these subjects have been analyzed by men holding between them all views, both biased and unbiased. The almost interminable sessions of the Senate Committee on Manufactures while the Calder bill was being discussed furnished by themselves and independent of all other sources of information, enough data to form a basis for a solution of the trouble, if it were possible for a solution to be artificially constructed.

For the sake of developing the thought, credit the fact-finding commission with an efficiency that will enable it to gather even the least important detail into its coffers of information—the industry will continue to hold a turbulent character, and no action based upon all this knowledge can remedy conditions so long as artificial laws are invoked and natural laws are violated in connection with coal labor questions.

In his address to Congress President Harding declared that the strike has revealed the "simple but significant fact" that the country is at the mercy of the United Mine Workers of America. It is this power of the miners' union that is responsible for the present condition of the industry, mainly because it is a power upon which there are no checks or balances and because it thus has been free to exert its strong force to suit itself without regard to the effects such exertion of force might have upon the coal industry directly and the industry of the country as a whole. No amount of fact-finding or legislation can remedy existing situations so long as this ungoverned force can assert itself in almost any way it sees fit, even in leading up to the Herrin massacre.

Sufficient authority and means for curbing this incomparable power already repose upon the law books of the nation, and it is to the pages upon which these measures appear that the government should look in its efforts to find the solution of the coal labor problem.

Bill Certain to Pass

However, it appears to be a certainty that Congress will provide authority for the creation of a fact-finding commission to investigate the industry, for the administration has requested such action and those who are not aware of the vast number of facts already developed quite logically enough are demanding such action.

The move proposing investigation did not find the operators lined up against it as they were when consideration was being given to the Calder and Frelinghuysen bills, simply for the reason that they recognize this as an earnest effort while the other bills were inopportune and tinged of the radical. With opposition lacking, the plan should make speedy progress, and an imposing array of facts should be gathered.

By the time the commission has its work under way, the conference between operators and union leaders to be held in Cleveland in October for the purpose of working out a scheme of wage adjustments will have reached some conclusion. It is in the results of this conference that the real hope of solution rests, for if the conferees can come to an agreement upon a logical means of wage-fixing that is economically sound, the greatest single trouble of the industry will be eliminated. If this work is well done the natural laws will begin to work out the problem of over-development by apportioning the labor where it is needed and eliminating it from the industry where it is mere surplus.

The President's second suggestion for legislation dealing with the present situation will bring the clouds of legislative storm over the Capitol, for many members of Congress have indicated their opposition to proposals to create a federal coal-purchasing agency, and leaders frankly have admitted that any measure having this creation for its purpose will encounter rough sledding in both houses.

The proposal is intended to deal with the immediate crisis primarily, and, as the President pointed out in his address, there may be no need for it even should it be passed. Members of Congress reason that it hardly can be considered a good bargain to throw the government into the light of entering the industrial world when there is not a driving necessity for such action. In addition to this basis of opposition, a rather general doubt exists as to the facility of the plan included in the President's suggestion. No substitute is offered, however, and those who will fall in line with the administration's views seeking passage of a measure providing the price-control agency will find this fact favoring them. The possibility exists that the break in the bituminous strike will place such a supply of coal upon the market that the competition which would be naturally induced under those conditions will hold prices down to a level in accordance with the law of supply and demand, with the fuel distributing machinery keeping its eye open to the situation.

Some leaders are inclined to believe that the longest step the government should take in the direction of price-control should be that of granting to the Interstate Commerce Commission additional authority to regulate prices by refusing freight cars to those mines that might seek to sell coal at unreasonable prices, eliminating other proposals.

The general hesitancy to enact legislation creating the type of agency suggested by the President is a direct evidence of the fact that Congress is aware of the pitfalls that fill the road along which paternalism by the government travels. Even when the President has recommended such action at a time of industrial crisis, the thinkers on Capitol Hill are going to give deep and long consideration to such a plan before they incorporate it in the laws of the nation.

The Probable Form

Should such a bill be passed, however, it probably would create an agency similar in form to the United States Grain Corporation which controlled the prices of grain during the war. Under this

THE COAL COMMISSION'S TASK

It is proposed that the Federal Coal Commission investigate the coal mining industry to ascertain the following facts:

Ownership of coal mines.
Price of coal.
Wages.
Wage contracts.
Conditions of employment.
Distribution.
Waste of coal.
Profits realized in the production, distribution and sale of coal.
And "any other material facts in connection with the coal industry generally and the organizations and persons connected with it."

The Commission is deputized to make recommendations as in its judgment will secure the following result:

"Promote continuity of production and efficiency in mining and distribution, and maintain an uninterrupted movement of coal in interstate commerce and safeguard the interests of workers, operators, and the public."

system operators would sell their coal to the corporation, which in turn would fix the price for fuel destined to enter into interstate commerce. Even this plan, it is being pointed out, would necessarily involve a tangible spirit of cooperation of the operators with the government, and since this spirit has been evidenced in strength during the weeks following initiation of the "Hoover fair price" system, those who are studying the situation closely are doubtful if there is enough gain in sight to warrant the government to set itself up as a functioning part of the business.

Students of the situation are finding much interest in the trend of events which led to the President's presentation of his views and suggestions to Congress.

Primarily, a torpid state of public opinion was responsible for the rejections met by the President's proposals in both the coal and rail strikes. This passiveness of the public deprived his efforts of a force which they otherwise would have carried and which would have made it impossible for the miners' representatives to reject his plan for settlement of the coal strike after the majority of the operators had accepted it. The attitude of labor toward the President's efforts is well exemplified in the statement made by a man in high power in labor circles when the strike began to the effect that the Executive had "no club in his hand."

The peculiar absence of the factor of public opinion in the case of the twin strikes may be attributed largely to the fact that enormous supplies of coal on hand when the strike began gave the country a sense of false security and disinterest from which it almost failed to recover even when the rail strike joined the coal crisis to make the situation one of the most serious type. Then, of course, there is the deeper psychological reason that may be advanced which points to the manner in which public interest and opinion has been losing its coherence and definiteness of form during the days which have elapsed since the signing of the armistice. So many complexities have come before the public mind to divide its attention, that it has been able to devote only a small part of its interest to each, and gradually has practically reached the "what's the use" stage, leaving its government to direct affairs and hardly offering even a faint indication of its opinion as guidance to those at the helm.

Labor's Attitude a Factor

The attitude of mind held by that large portion of organized labor outside of the miners' and railway men's unions also seems to have been standing up as a factor in the apparent dormancy of public power of expression. It appears logical to presume that this vast host of workers could not become greatly enthused over efforts of the striking men to hold mine and rail wages at practically wartime levels long after workers in other branches of industry accepted liquidations in the prices they received for their work.

And because the public, for these and probably many other minor reasons, did not assert itself during the early days of the strikes, the administration was deprived of one of its strongest potential leverages in handling the situation, with the result that there was a lack of power behind the President's efforts for "moral suasion" which otherwise would have been strong enough to demand acceptance of his proposals.

This lack of public opinion, combined with the type of obstinacy characterizing the miners' refusals to arbitrate or accept district agreements, finally forced the President to abandon his efforts in large measure to effect settlement of the strikes. He then began laying plans to place before Congress the historical facts of the situation together with an indication of the necessity of preventing recurrence of the troubles so far as possible by striking deep in efforts to provide the foundations for permanent settlements.

COAL COMMISSION IS TO FACE BROAD FIELD IN FOLLOWING INVESTIGATIVE PROGRAM

THE CHANNELS along which it is proposed that the coal investigation will proceed have been specifically outlined. The measure introduced in the House makes it the duty of the commission to investigate and ascertain facts in the coal industry as to the ownership of coal mines, price of coal, wages, wage contracts, conditions of employment, distribution, waste of coal, profits realized by owners or operators of coal mines, or by other persons or corporations having to do with the productive distribution or sale of coal, and "any other material facts in connection with the coal industry generally and the organizations and persons connected with it."

The commission is deputized to make recommendations with a view to creating conditions which will "promote continuity of production and efficiency in mining and distribution, and maintain uninterrupted movement of coal in interstate commerce and safeguard the interests of workers, operators and the public."

Points of Investigation

In entering into a detailed study of the elements contributing harmful effects to the bituminous mining industry, the commission finds the following points open for its investigation:

Waste of capital through forced abandonment of unliquidated investments in production facilities; waste of capital through operations which burden future recovery of coal with undue expenses; waste of capital through excessive demands on railroads for transportation facilities; waste of labor through intermittency of employment and through voluntary absentation from work; undue strain on traffic facilities inspired by seasonal demand and by abnormal traffic loads following periods of idleness; preferential treatment alleged to be given mines having private cars and mines furnishing railway fuel; storage facilities at docks for railroad fuel and at points of consumption.

Closely related to and naturally arising from these studies, detailed observations will probably be made of the following factors:

Over-development of production facilities; necessity of being in a position during normal times to meet increases in the demand caused by seasonal changes and changes in the industrial condition; over development fostered by methods of mining under which the cheapest coal is mined in the earlier years of the mine, thus enabling more recently developed properties to undersell temporarily those longer established in the same district; over-development resulting from war and post-war conditions; opening of mines not economically justified; abnormal increases in development of established mines; lack of co-relation between the tipple capacity and capacity developed under ground; lack of co-relation between the coal-cutting capacity and mine transportation facilities; causes of mine disability; lack of adequate equipment; cases where forces of company men are inadequate as compared with the number of miners paid on a tonnage basis; cessation of work through vacations, organized strikes or sporadic absenteeism.

To Study Competition

The commission may find further material for its work in the competition of other fuels with coal, particularly fuel oil and natural gas. Under this same general head of investigation appear possibilities of investigation of Canadian coal importations and also of hydro-electric installations in their tendency to affect the amount of coal consumption.

Means of attaining the following improvements are quite likely also to be considered:

Improvement of transportation facilities, both by rail and water, and the handling facilities at docks, more effi-

cient methods of distributing coal to wholesalers, brokers and retailers; utilization of the low grade product, unfit for shipping, by conversion near the mines into electricity; development of new markets both abroad and by special reparation to fit certain industrial uses.

In addition to all these activities the commission will find itself charged with the duty of ascertaining facts concerning ownership of coal mines, price of coal and profits realized: here will "come the rub," for pursuit of these phases of investigation will carry the commission deep into complexities of economic factors, which will prove far more bewildering than the purely physical problems of the industry.

A variety of conjectures are being put forth in efforts to anticipate the recommendations to be made by the commission. Among the possibilities being advanced in this connection are the following:

Compulsory closing of hopelessly inefficient mines by requirements that the product meet certain preparation standards and that prescribed mining methods be followed; establishment of legalized pooling of coal resources of an entire field; establishment of a coal labor board or of some other form of compulsory or voluntary arbitration to prevent stoppage of production through labor disputes; reform of car distribution rules.

BRITISH EFFORT TO CURE SEASONAL COAL TROUBLES PROVES MALADY IS GENERAL

STRONG INDICATIONS that seasonal unemployment is generally attached to the mining of coal in so strong a manner as to be almost inseparable from the industry are found in reports reaching the Department of Commerce which state that the United Kingdom has concluded an investigation of the question of providing stocks of coal which would tend to make employment at the mines more regular. Observers see in these reports a contradiction of charges that the coal mining industry of the United States is suffering from seasonal operations because of inefficient management. They claim that the fact that the British industry feels the same burden, despite its long establishment, proves that troubles of this type with which the American industry has to contend are practically unavoidable so long as the whole general scheme of operation remains as it is.

It is of interest to note that Trade Commissioner Alexander B. Dye of London, who makes the report on the British effort to evolve a more efficient storage of coal, states that the investigation conducted in the United Kingdom has accomplished nothing and secured no results which have not already been brought out by similar studies in the United States.

The matter of coal storage was rather fully investigated by the Sankey Commission in 1919, and the conclusion was reached that it was not a practicable proposition in the United Kingdom. The more recent studies have brought to light additional difficulties. Estimates with regard to depreciation of quality, and hence of value, were that storage of house or soft coal would involve a loss of 15 to 18 percent in slack alone. For industrial coal it was estimated that the additional cost of storage and depreciation would amount roughly to 25 percent of the value of the coal, making the process of storing a very expensive one. Another difficulty is found in the lack of available space for storing coal, since the cities are too congested and the mining areas too mountainous to permit of sufficient space being devoted to storage on a large scale.

Summarized, the reasons for impracticability of storage in Great Britain are given as follows: The differences between points of production and consumption are not great; no arrangements ever have been made for stocking, and that the large amount of deterioration due to weathering and breakage, together with the increased cost of handling, add to the points brought against the practice.

ABNORMAL COAL WAGE PLANE ATTACKED BY SECRETARY OF AGRICULTURE

WHILE LEADERS of the United Mine Workers at the coal conference in Cleveland were successfully imposing a continuation until April 1 of the coal miners' war-time wages, Secretary of Agriculture Wallace, an unbiased observer, was publicly pointing out the ridiculously high level at which these wages are pitched. Addressing members of the Farm Bureau at Leesburg, Va., August 14, Secretary Wallace pointed out that "the value of income, whether it be in the form of wages or of money received for sale of products, is represented not in dollars and cents but in what that income will buy by its purchasing power. He then presented graphic statistics showing the unjustified increase in the amount of farm products purchasable with the average wage received by the miner for mining a ton of coal in 1921 as compared with the purchasing power of the corresponding wage in 1913.

"In 1913 this wage per ton would buy 1.1 bushels of corn in Iowa; in 1921 it would buy 2.5 bushels of corn in the same market," the Secretary declared. "In 1913 the ton wage would buy .7 of a bushel of wheat in North Dakota; in 1921 .9 of a bushel. In 1913 it would buy 4.7 pounds of cotton in Texas; in 1921 8.5 pounds. In 1913 7 pounds of hog in Nebraska; in 1921 14 pounds. In 1913 .8 of a bushel of potatoes in New York; in 1921 1.2 bushels. In 1911 11 pounds of sheep in Wyoming; in 1921 18 pounds. In 1913 1.6 bushels of oats in Illinois; in 1921 3.1 bushels. In 1913 2.4 pounds of butter in Missouri; in 1921 3.2 pounds."

COAL BILLS ARE VOGUE IN CONGRESS

BILLS PROPOSING various forms of investigation and regulation of the production and distribution of coal sprang up in both Houses of Congress with mushroom-like rapidity, following President Harding's request that legislation be passed to meet the present emergency and to prevent a recurrence. Within a few days after the President addressed the legislators, the following bills had been introduced:

By Senator Cummins (Rep.) of Iowa—To extend the powers of the Interstate Commerce Commission to provide for the equitable distribution of coal and the regulation of prices.

By Senator Borah (Rep.) of Idaho—To create a commission to investigate the coal industry with a view to nationalization and to fix standardized wages.

By Senator Walsh (Dem.) of Massachusetts—To authorize the President to take over and operate the coal mines.

By Senator Edge (Rep.) of New Jersey—To authorize the President to take over the coal mines through condemnation proceedings.

By Congressman Winslow (Rep.) of Massachusetts—(1) To establish a Federal agency for the distribution of coal. (2) To create a federal commission to investigate the coal industry.

By Congressman Dickinson (Rep.) of Iowa—To authorize the government to operate the mines, settling all disputes through a federal "mine and labor board."

By Congressman Brennan (Rep.) of Michigan—To restore the government's war-time powers to conserve fuel by again establishing "heatless days" and "lightless nights."

BLUE-SKY BILL'S CRITICS ARE IN MAJORITY

Senate Committee Receives Many Expressions of Opinion Despite Fact That Measure is Not Likely to See Action Until Next Session—Real Estate Boards and Bankers Join Mining Men in Opposition to Bill—Wide Variety Shown in Criticisms

ALTHOUGH CONSIDERATION of the tariff bill has thrown the Denison blue sky bill so far back on the Senate's working schedule that there is little chance of even committee action being taken upon it during the present session, the measure continues to draw a lively fire of criticism and a certain flow of praise from its opponents and advocates throughout the country. The Senate committee on interstate commerce, with which the bill is resting following its passage by the House, is receiving many communications from organizations and individuals whose expressions of opinion are just as strong as though the measure were to come up for a vote this week, instead of being destined to probably await the next session of Congress before it makes legislative progress.

Preponderance Against Bill

The preponderance of opinion expressed in these communications is against the measure, with real estate boards, bankers and individuals setting forth their criticisms in unmistakable terms. Advocates of the bill for the most part are connected with state securities commissions, with their ranks being filled by investment bankers.

The mining industry has gone on record as opposed to the Denison bill, this stand having been taken at the conference of western mining men recently held at Denver, but admits that proper protection should be offered the public against fraudulent securities, and, for this reason, does not condemn the blue sky principle as an entirety.

Objections to the Denison bill voiced by the mining men center upon the plan which seeks to set an individual or a commission to pass upon the legitimacy of investments, holding that supervision of this sort is liable to bias, or at least to mistakes caused through ignorance of the technicalities of an industry holding so much of the hazardous in phases of velopment as do mining operation The Denver conference adopted a resolution carrying with it a tentative draft of a federal securities act which is to be submitted to the Board of Directors of the American Mining Congress for consideration as a possible substitute to be offered in place of the Denison bill.

Additional points of criticism are raised by the opponents of the bill who have presented petitions to Congress protesting against enactment of the measure.

The Real Estate Board of Baltimore declares that the bill will work serious injuries and hardships on persons desiring to borrow money for construction purposes and to finance crops. The Columbia Mortgage Company of New York opposes the provisions regarding mortgages.

Branded As "Unwise"

That the legislation is "unwise" is stated in a petition by George M. Van Evera, of Des Moines, Iowa, who declares that worthless investments continue despite state blue-sky laws.

While the bill is supposed to have been endorsed by the stock exchanges, whose securities it exempts, the New York Consolidated Stock Exchange has suggested modification of the measure on the ground that it is unduly strict, and that it will operate to exclude securities.

The point is made by the Traffic & Service Bureau of Minneapolis that the bill will stiffle all incentive on the part of investors, chemists and mining engineers and that it will throttle progress. The bureau furnished the committee editorials from the Denver Mining Record and the National Oil Journal of Fort Worth, Texas, opposing the legislation.

William A. Lockwood of New York opposes the bill on the ground that it will injure the curb market of New York; and opposition is also expressed by the Mortgage Bankers of Chicago.

The bill is declared to be a "jumble of inconsistencies" by the Farm Mortgage Bankers' Association of Chicago, in that it will retard the flow of capital between the States and prevent the general leveling of interest rates East and West. The claim is made that instead of being conducive to uniformity in the matter of blue sky regulation, the bill will add to the present confusion. It is said that a number of people who have supported the measure have done so under a mistaken idea of its effects.

Real Estate Men Object

Opposition is also expressed to the bill by the Association of Real Estate Boards, with offices in Toledo and Pittsburgh.

The Iowa Farm Mortgage Association opposes the bill, stating that congressional endorsement of many kinds of securities of doubtful value would have a tendency to promote instead of to check fraud. It is said that fraudulent securities are generally sold by high pressure salesmen personally negotiating sales, and that no large quantities of such securities are bought through the mail. The bill will have no effect in preventing numerous frauds which have been committed in the past, and which will likely be continued in the future by salesmen who defraud by personal contact, it is declared.

On the ground that the legislation interferes with the powers of the States and adds to the machinery of the federal government and will put a premium on worthless securities, R. S. Baker, attorney of Dallas, Texas, opposes the bill.

The bill will wipe out small investors and enable large investors to obtain complete control of the oil industry, according to R. W. Strachan, of Galveston, Texas.

Opposition is Indicated

Inquiries as to the status of the bill, indicating intention to oppose it when hearings are held, have been received from Buffalo, New York, the District of Columbia, New York City and Illinois.

Support for the legislation comes largely from state securities commissions, although a few others favor the bill, including Sullivan & Cromwell, attorneys of New York, and Earl A. Pivan, of Denver, Colo., advertisers. The Pivan Company says unscrupulous promoters ought to be denied means of foisting their wares on the gullible portion of the public, and also prevent them from evading Federal and State restrictions. The company recommends that Congress impose an organization tax on common law trusts and to require them to observe the laws concerning corporations, income tax, and capital stock as well as stamp taxes.

State organizations which have urged favorable action on the bill include the following:

The North Carolina Insurance Department, the Rhode Island Bank Commissioner, the Georgia Securities Commission, the Wyoming Secretary of State, who says the West is flooded with literature of fake oil companies and that existing laws are not effective; the Arizona Corporation Commission; the Arkansas Banking Department; the National Association of Securities Commissioners of Lincoln, Nebraska, and the Florida Comptroller and Chairman of the State Securities Commission.

TARIFF BILL GOES TO CONFERENCE

Differences between Rates Fixed by Senate and House To Be Acted Upon by Conferees—Many Items of Metal Schedule Included in List of Products on Which Rates Not Yet Have Been Fixed

THE TARIFF bill is now in conference. The action of the conference committee is limited to the consideration of such rates as have passed each house. No rate can be agreed to in conference which is higher or lower than any rate which has passed either house.

The Apparent Program

While there has been considerable speculation on the possibility of the tariff bill being reported out of conference before elections in November, it is reasonably safe to predict that the bill will become a law within sixty days. This is the present apparent program.

The conference committee will comprise the following members:

Republican Senators: McCumber, North Dakota; Smoot, Utah; McLean, Connecticut. Democratic Senators: Simmons, North Carolina; Jones, New Mexico. Republican Representatives: Fordney, Michigan; Longworth, Ohio; Green, Iowa. Democratic Representatives: Garner, Texas; Collier, Mississippi.

In the case of the rates of duty on the following items, the same rate having been passed by both houses, no change will be made in conference:

Aluminum; crude asbestos; barytes; bauxite; chrome ore, chrome yellow, chrome green, and other colors containing chromium, in pulp, dry, or ground in or mixed with oil or water; lead (agreement upon the proper limitation upon importation of lead contained in copper mattes necessary); tungsten ores and concentrates; magnesite brick; manganese ore; zinc chloride; zinc bearing ore (par. 390) and par. 311 concerning tin products.

Agreement Within Bounds

Included in the necessary conference action is the reaching of agreement upon rates on the following items of the Metal Schedule which shall not be higher than those accepted by either house and not lower than those accepted by either house:

Antimony and antimonial salts; arsenic; asbestos (except crude asbestos which remains on the free list); chrome brick (par. 201); electric storage batteries; fluorspar; graphite; magnesite (par. 47 in House bill and par. 204 in Senate bill); magnesium; mica; molybdenum; nickel (except ores of nickel and nickel matte which remain on the free list); pumice stone and manufactures; tungsten alloys, with agreement to the Senate's additional protective provision (par. 292b) or some compromise thereon being necessary; zinc oxide (par. 74).

In addition it will be necessary for the conference to take the following necessary actions:

Bismuth, agreement upon rate not higher than 7½ per centum ad valorem; cadmium, agreement upon rate not higher than 15 cents per pound; ferro-manganese, agreement upon rates between 1⅞ and 2 1/5 cents per pound and also an agreement on the basis of classification of ferro-manganese on manganese content must be reached; vermillion reds (par. 73), agreement on rate not higher than 33 cents per pound nor lower than 28 cents per pound; quicksilver, agreement on not higher than 35 cents nor lower than 25 cents per pound; azides, fulminates, fulminating powder, etc. (par. 1516 in House bill and par. 387 in Senate bill), agreement upon rate not higher than 12½ cents per pound; calomel, etc. (par. 16), rates being on American and foreign valuation plan in House and Senate, respectively, will not be subject to change, except in accordance with the valuation plan accepted; tin bichloride, tin tetrachloride, etc. (par. 85), these rates on American and foreign valuation plan in House and Senate, respectively, will not be subject to change, except in accordance with the valuation plan accepted; sheets of plate or iron or steel, etc. (par. 310), agreement upon rate not higher than 1 1/10 cents or lower than one cent per pound; powdered tin, etc. (par. 379), agreement on rate not higher than 16 cents or lower than 12 cents per pound; tin in bars, etc. (par. 386 in House bill and par. 1688 in Senate bill), agreement on a rate not higher than two cents per pound; bottle caps, etc. (par. 387), these rates being on American and foreign valuation plan in House and Senate, respectively, will not be subject to change, except in accordance with the valuation plan accepted.

The following items will remain upon the free list:

Crude asbestos (par. 1515); cyanide; iron ore, including manganiferous iron ore; ores of nickel and nickel matte; potash; sulphur and pyrites; tin ore or cassiterite; petroleum.

COAL SHORTAGE IN CANADA IS FORESEEN

THERE IS possibility of a coal shortage in Canada, owing to the protracted strike in the United States. Consul General Brittain, Winnipeg, reports that imports of coal into the provinces of Ontario and Quebec for the first six months of 1922 represented only 55 and 47 percent, respectively, of the average supply. In commenting on the situation in the Prairie Provinces, the Dominion Bureau of Statistics says:

A rather unusual feature of the import statistics is that Manitoba has received during the past six months some 14,000 tons of bituminous round and run-of-mine, as compared with an average import of 13,000 tons. Bituminous slack received at the customs ports during the first half of the current year amounted to 29,000 tons, against an average of 14,000 tons in the three preceding years. It is to be noted, however, that much of the coal dumped at the head of the lakes finds its way into Manitoba and the Western Provinces, and the receipts there for the first six months of the present year amounted to only 1,600 tons of bituminous and run-of-mine, against a three-year average of 350,000 tons. No bituminous slack has been reported this year, whereas the three-year average receipts for the period amounted to 24.000 tons. No anthracite has been received at the customs port at the head of the lakes this year. In the three preceding years an average of 71,000 tons had been received by this time.

COAL STRIKE PROVES BOON TO BRITISH MARKET

TRADE COMMISSIONER Alexander V. Dye, in dispatches to the Department of Commerce from London states that the American demand for British coal that has sprung up recently has been a very welcome relief to the coal trade. Previously, the output in the United Kingdom had been steadily declining for about six weeks. Prices, also, had been dropping until they had reached as low as 24s. 3d. per ton for best admiralty steam Welsh.

At the present time practically all collieries are sold out for August and some into the early part of September, although there are always odd lots to be picked up. On July 29 prices to the United States eased off, the last quotations which were cabled across having been rejected.

CONSTRUCTIVE PLATFORM FOR MINING CONVENTION

Ways and Means of Inviting Prosperity Through Economy to be Sought at Twenty-Fifth Annual Convention of the American Mining Congress—Relationship of Government to Business Will be Analyzed—Industrial Harmony to be Aim

"GREATER Prosperity Through Lower Production Costs" will be the central theme of the sessions at the Silver Anniversary Convention of the American Mining Congress, to be held at Cleveland, Ohio, October 9-14.

The real purpose of this convention, which will be the largest and most representative gathering of mining men which has ever been held, will be if possible, to formulate a constructive national platform for the mining industry which will have the united support of the different branches of the industry and which, by cooperative efforts, will result in the further expansion and the development of mining.

To Concentrate Attention

In carrying out this plan for the convention at Cleveland, an effort will be made to focus the attention of the delegates on the vital problems confronting the industry and to avoid the introduction of too great a diversity of topics for consideration.

The first general topic to be considered at the convention at Cleveland will be "The Function of Government in Relation to Industry." An essential factor in the increase of industrial costs in the United States has been the steady increase in governmental paternalism as applied to industry. The direct restrictions placed by the government on industrial developments and the indirect results caused by such restrictions are, in the opinion of many, a distinct menace to the further development of individual incentive and initiative in carrying forward industrial enterprises. The present administration at Washington is doing everything in its power to reduce the cost of government and, as far as possible, to prevent the further abridgement of individual liberties by governmental supervision and restrictions.

Public Support Needed

In this effort, the leaders of the administration need the support of public opinion and it is essential that the mining industry in keeping with the resolutions which were passed at Denver at the Western Mining Conference, June 20 and 21, should definitely adopt a national attitude protesting against the further increase of governmental restrictions as applied to industrial development. Leaders of the present administration at Washington will present their point of view in regard to the function of government as applied to industry and it is expected that there will be inaugurated a national movement on the part of mining men to assist in eliminating the addition of unnecessary costs through governmental supervision.

Industrial Cooperation

The continual and seemingly unending strife between labor and capital is another factor which has greatly increased the cost of industrial production in this country. During the last few months the country as a whole has had a bitter lesson in the effect of such strife upon general prosperity. At the very time when it seemed as if the industrial skies were clearing and when this country could look forward to a period of general prosperity, the coal strike and the strike of the railway shop men presented a barrier which made impossible a real return to normalcy.

RICHARD F. GRANT
Chairman, Committee on Arrangements

There must be some solution by which the needless friction between labor and capital can be eliminated and by which both labor and capital can profit through increased production. In some of the largest mining enterprises in this country as well in industrial plants, experiments have been tried along the lines of industrial cooperation and in some cases the success of these experiments has indicated the possibility of the development of a real national movement along these lines. The subject of industrial cooperation, therefore, will be one of the major topics presented at the Cleveland Convention—not by theorists but by employers who have in a practical way actually secured results which have led definitely to the establishment of greater cooperation and greater confidence between employers and employees.

The standardization of mining methods and mine equipment is in itself perhaps the most important step towards the development of greater prosperity through lower production costs. The Standardization Conferences of the American Mining Congress at previous conventions have laid the ground work for the further development of this great national movement, and the standardization sessions will be of particular interest both to the operating officials in charge of mining enterprises and to the manufacturers of machine equipment.

The unfair and discriminatory taxation of mines and mining enterprises has been one of the most important factors in increasing the costs of industrial production and distribution. The Tax Division of the American Mining Congress in cooperation with the representative mine tax committee have formulated a program for the Cleveland Convention which will furnish the basis for a thorough discussion of the problems of mine taxation and the methods which can be utilized and developed for securing some relief for mining enterprises from the oppressive burdens which they are now bearing. The Mine Tax Conferences will be of especial interest to the western mining producer.

Coal Men to Confer

Another important feature of the Convention at Cleveland will be a representative conference of coal operators to discuss the problems of the coal industry. Both the anthracite and bituminous coal fields will be well represented on the program and there will be a special session of the Convention devoted to a consideration and discussion of the problems of the coal industry.

Crises in this industry have become chronic, resulting in loss and suffering not only to the coal operators and to the workers but to the general public as a whole. The Cleveland Convention affords an opportunity for coal operators to formulate a plan which will have the combined support of the other branches of the mining industry and because of that support, can be made effective.

The question of Blue Sky Legislation is another factor which indicates the spread of governmental supervision and

which effects the further development of mining enterprises. The Cleveland Convention will devote a session to the discussion of Blue Sky Legislation and an effort will be made to outline a plan which will be constructive, which will penalize the fraudulent sale of securities, and which at the same time will not be a further encroachment on individual initiative in the development of mining enterprises.

The Cleveland Convention of the American Mining Congress is a national celebration of twenty-five years of mining development. The lessons which the industry have learned from the past should be utilized at Cleveland in formulating a national program which will satisfactorily and effectively meet the requirements of the industry for the future. Every mining man who is interested in the further expansion of the industry and in serving his own interests should plan to be present at Cleveland to participate in this convention and to assist in the formulation of a national platform for the mining industry.

WESTERN DIVISION PERFECTS ORGANIZATION

By BURTON BUNCH
Western Secretary, American Mining Congress

WITH SEVEN of the thirteen western mining states already represented in the roster of the Board of Governors of the Western Division of the American Mining Congress, and three other states now considering the immediate selection of their separate members of the board, plans are nearing perfection for the organization meeting of the division, to be held in Salt Lake City on September 11. At that time the chairman of the Board of Governors will be selected and at least a tentative list of such committees as may be deemed necessary will be appointed. In addition one or two very important questions which have arisen since the June conference in Denver will be discussed, and of these matters the individual mining organizations in each of the western states are being informed, with urgent request that their representatives be sent to the Salt Lake meeting.

To Discuss Labor Shortage

The major problems in which the west is interested were discussed and disposed of as fully as possible at Denver, the conference there functioning in much the same way it is expected future meetings of the Western Division will function. Except for the fact that unprecedented industrial conditions throughout the country have brought about a situation with regard to mine labor, of which there is a shortage in many camps, no meeting of the Western Division would have been considered necessary until the time of the national Mining Congress Convention in Cleveland in October. These changed conditions, however, have impressed a number of interested operators of the West, men who are interested in the Western Division, with the necessity for an immediate gathering of the western mining men to discuss them. Salt Lake City seems to be the logical place for the first meeting since that city is to be the future headquarters of the division. The offices of the Utah Chapter in the Kearns Building have been made available by the Secretary, A. G. MacKenzie, for the gathering.

The seven states which have already named representatives, and the names of these representatives are as follows, in the order in which the appointments were made: Colorado, George Stahl, Denver; Utah, D. D. Muir, Jr., Salt Lake City; New Mexico, John M. Sully, Hurley; Washington, Sidney Norman, Spokane; California, Edwin Higgins, San Francisco; Montana, Wm. F. Word, Helena, and Arizona, Robert E. Talley, Bisbee. The states soon to act upon the provision of the resolution creating the division, authorizing the naming of one man from each state to serve as a member of the Board, are Nevada, Oregon and possibly Idaho. In Colorado, Utah, New Mexico, California and Arizona the appointment has been made in each case from among the membership of the state chapter of the Mining Congress. In Washington Mr. Norman's selection was by joint action of the Northwest Mining Association; Washington State Metal Mining Association; The Mining Bureau of the Spokane Chamber of Commerce and the Seattle Chamber of Commerce. The Montana Mining Association announced the appointment of Mr. Word from that state.

Concerted Interest is Aim

Efforts are now being directed toward the creation of a concerted interest in North and South Dakota and Wyoming to bring about the selection of men representing those states to serve on the general board. In the absence of state organizations in some of these states the governors of the states are being asked to arrange for official selection. It is possible that by the time the meeting is held in September in Salt Lake at least 12 of the 13 states will have announced representation.

Inasmuch as the Denver Conference at which the Western Division was created, did not include Alaska in the division, it is likely that the first meeting of the Board of Governors will discuss the advisability of inviting the territory to appoint a man for membership. Such an invitation would be acceptable to many of the mining men of Alaska, as is evidenced by the attitude of the Alaska Department of the Seattle Chamber of Commerce, of which Charles D. Garfield is in charge. The Seattle Chamber of Commerce has recommended the inclusion of Alaska.

Representation from Oregon is being discussed by Henry M. Parks, Director of the Buerau of Mines and Geology, and some of the men in that state interested in the Western Division have suggested the organization of an Oregon Chapter of the Congress. The same is true as to Idaho, particularly among the men in the Coeur d'Alenes.

To Lay Foundation

As a result of the Salt Lake City meeting, it is expected that the foundation of the program for the year following the national meeting in Cleveland will be laid out and that the month between the date of the western meeting and the national convention will give sufficient time for each state's representative to acquaint the industry in his own state with the way in which the division will handle the most pressing problems. Western Division conferences will be held in Cleveland as a part of the general convention, and the annual meeting of the division thereafter will be held in conjunction with the Mining Congress annual sessions. One other meeting each year at time and place to be named by the Board of Governors is to be held somewhere in the west, usually in the summer.

MINE POWER STANDARDIZATION ASSURES ECONOMIES

Reduced Costs Will Follow Assignment of Definite Standards to Underground Electrical Apparatus, Mining Congress Committee Declares—Bewildering Rapidity of Development Has Been Obstacle

By JOHN LISTON
Member A. I. E. E. and N. E. L. A.

ON A PURELY statistical basis it is evident that the mining industry of the United States is more efficient than that of any other country, and that the average output per operative is much greater. In fact, the average per capita production of the American mine operative is in most cases more than double the volume secured in corresponding European practice.

Reason For Superiority

This condition is due not to the superior ability of the American miner, but to a large extent can be attributed to the more general use of machinery in American mines and its operation by electric power.

Under these conditions it might be assumed that a considerable degree of standardization in electrical mine equipment and methods of operation had been attained, especially as electrical apparatus has been used in this industry for more than thirty years; but such is not the fact, despite continuous efforts by engineering societies and electrical manufacturers to establish acceptable standards.

There are many reasons for the failure of an energetic and aggressive industry to secure the economic benefits of standardization of productive machinery, especially where operations are carried on involving the continuous handling of an enormous tonnage.

One reason has been the bewildering rapidity in the development of electrical apparatus in the past two decades during which time the products of research, invention, design and manufacture have successfully brought to the attention of the mining operator continuous improvements in the economy or efficiency of the electrical apparatus designed for mining service.

Another Complication

This has been further complicated by a similar development in the mechanical equipment and the difficulty of coordinating the efforts of mechanical, electrical and mining engineers due to the diverse problems presented by the varying physical characteristics of the mines themselves, which impose definite limitations in the design and construction of both mechanical and electrical equipment due to the operating conditions which must be met.

It is a comparatively easy matter to standardize on the equipment of a central station of given capacity or of a factory or mill for the production of a certain class of materials, for in these cases the conditions under which the electrical equipment will operate are definitely known, but in a mine the electrical equipment, in addition to carrying the definite load for which it has been designed, may be called on to withstand the effects of moisture or dust and the effects of acid and gases as well as a great variety of temperature conditions. The design of the apparatus is also complicated by the requirements for safety which is of paramount importance in mines and the attention given to this feature will vary with every installation, some mines being of such character that practically standard service equipment will suffice, while in other cases the motors must be totally enclosed or explosion proof and all switching and control apparatus immersed in oil or protected by special methods.

PUTTING DAYLIGHT UNDERGROUND
This view of the foot of a mine shaft lighted by Mazda lamps with reflectors shows how improved illumination can be obtained with fewer lamps by the use of reflectors

Despite these difficulties it would seem that more effort could have been made by those interested to secure at least a degree of standardization in the electrical equipment of mines, as it is generally conceded that even incomplete standardization insures economies to the user as well as to the manufacturer. That this is fully appreciated by many men in the mining industry is indicated by the fact that, in a number of individual mining properties, the specifications for a considerable part of the mine electrical equipment has been arranged on a local individual standard basis.

The maximum benefit to the industry as a whole, however, can only be secured by the active participation of a large majority of mine operators in efforts to create suitable standards, either of construction or performance, or both, which can be met by the manufacturer and have the support of those purchasing equipment for the mines.

As an example of what has already been accomplished along these lines, the "Power Club" standard classification for mining locomotives may be cited. This gives a definite basis of motor rating for each size of locomotive, weights for a limited number of units for single, two and three-motor locomotives, ranging from 1 to 35 tons and recommend 250 and 500 volt as operating voltages. Definite temperature rise limits and methods of determining draw bar pull are given as well as the basis of guarantees which the manufacturer must meet. The rating standards of the storage battery type also include battery specifications.

Prior to the formation of these standards, there was a great variation in the interpretation of specifications by the different manufacturers and the production of a number of odd sized locomotives which have now been eliminated.

The adoption of these standards by the manufacturer has enabled him to reduce the number of drawings, patterns, assembly parts, etc., and has made it possible for the first time to produce mine locomotives on a tube manufacturing basis. As an indication of this, it is now possible to make shipment of the more common sizes of locomotives in about ten days, by assembling them from parts in stock, whereas it formerly required about three months to complete this work.

Can Be Eliminated

The testing track of manufacturers of electric mine locomotives indicate the great variety of existing rail gauges in mines. It is obvious that many of the intermediate gauges could be eliminated and it has been strongly recommended to the industry that track gauges of either 24, 36 or 42 inches be adopted. This, to-

gether with the standardization already effected in the locomotive itself, will reduce the number of repair and supply parts which must be kept on hand for the maintenance of the mine railway and will also render possible a certain degree of interchangeability between the equipment of different mines. The diversity of gauges has been very disadvantageous in this respect in many cases in the past.

A Reasonable Idea

It would seem reasonable to complete the standardization of this one feature of mining equipment by specifying material and performance standards for mine railway line material. The same action could be taken in regard to various types of insulators, suspensions, rail bonds, etc. Efforts in the past to accomplish this result have, perhaps, attempted too much in the matter of delimiting the physical dimensions of these line materials, but if the problem were approached on a purely performance basis, it would give the manufacturers a definite standard which would be of practical value to the mine operator and in no way hamper the development of the art through the production of improved materials or changes in existing design.

It will probably never be possible to establish any complete standardization rules on the hoisting equipment for mines, at least for the main hoisting units, as practically every mine presents special conditions which involve problems not encountered in other properties. Nevertheless, it seems reasonable to expect that some degree of standardization could be effected even here by the establishment of methods for the calculation of the duty cycle and defining operating and safety factor limits within which the control must operate.

In regard to the operation of fans, there is at present a considerable difference of opinion among mining, mechanical and electrical engineers and a great variety of electric drive and control equipments have been installed. While it is not as yet advisable to make general recommendations for the use of direct current or induction, slip ring, brush-shifting or other varieties of alternating current motors for this service or even to decide on rope, belt or other forms of connection between the driving motor and the fan or blower, there is no insuperable barrier to the establishment of certain fundamental requirements and safety factors in the system of control adopted.

This particular feature of mining equipment has been a subject of considerable controversy, which has been carried on to a large extent by those outside of the mining industry. However, it may be of great importance in the economical operation of mines and a more active participation of the engineers in the mining companies would undoubtedly hasten the adoption of as much standardization as is possible, with beneficial results to the mining industry as a whole.

On the other hand, the electrical equipment for air compressors, pumps, loaders, drills, coal cutters and similar machines can, perhaps, be more efficiently handled by the manufacturers of this apparatus in collaboration with the electrical manufacturing companies, as modern motor driven outfits of this class constitute practically self-contained units. The high over-all efficiencies ob- units.

The methods of installing and protecting control equipments in mines are exceedingly diverse as is the interpretation of what constitutes non-corrodible material when used in their construction.

The selection of the degree of protection is largely left to the individual judgment of the mining engineer or state mine inspector and varies all the way from a condition of positive danger to one of what might be called super-safety and, while it might appear that the individual mining engineer was the most capable judge of conditions in this particular mine, it will not be denied that similar conditions formerly existed in regard to the use of explosives in mines and that, while the establishment of definite standards for explosives may have increased operating expenses in individual cases, still the industry as a whole has benefited enormously from this standardization.

It is scarcely an exaggeration to classify the control equipment of electrical apparatus in mines with that of the use of explosives in its influence on the degree of safety which can be maintained in the operation of modern mine electrical equipment.

A Woeful Neglect

There is one feature of mine electrification which is easily capable of a high degree of standardization but which has been woefully neglected in the average mine. This is the underground lighting system which, in most mines, presents a sad spectacle to the illuminating engineer.

Of course it is more difficult to install and maintain a lighting system in a mine than to secure good results in the lighting of a factory, and it is true that there are relatively few points in the mine where permanent light is required to facilitate working. For lighting the faces of the seam, the electric cap lamp or open flame torch serves the purpose rather well but such lighting is inadequate for such places as the foot of the shaft, foreman's shanty and junction points.

Most mines adhere to the doubtful practice of using bare lamps, either carbon or mazda, with the result that the light is poorly distributed and about half of it is altogether lost by absorption by the dark rough walls and ceilings of gangway headings, etc. The use of suitable reflectors would, in practically every case, double the efficiency of such installations and permit the light to be directed to the area where illumination is required.

The question of safety is always involved in that of lighting and this has been recognized by the lighting codes adopted by various states for factory lighting. The disparity in this respect between mining and other industries is indicated by the fact that for every worker in outside industries, there is a 75 watt lamp, while in the mines of the United States there is an average of only a 5 watt lamp per worker.

Use of Reflectors

The use of reflectors for lamps in mines, as shown in the illustration, is more important than in outside industries, where walls and ceilings of buildings assist in the reflection and diffusion of light, whereas in the mine, with its dark surroundings, it is necessary to install relatively large lamps and to shade these properly so that glaring conditions are avoided if suitable illumination is to be maintained.

This is neither difficult nor expensive and, as the energy required for lighting is a very small percentage of that required for power, the speeding up of work under good lighting conditions will usually result in a definite economy even if the additional safety factor is not taken into consideration.

It must not be thought from the above that the writer is unmindful of the efforts that have been made in the past by the U. S. Bureau of Mines and the mining engineering societies to provide standardization for electrical equipment, and the very comprehensive rules which have been prepared for the safe installation and operation of electrical apparatus and lighting and signal systems are clear indications of the thought and effort which have been given to this all important feature.

There remain, however, the problems of standardization which will affect the performance characteristics of electrical mine equipment, and the proper solution of these problems will permit the industry to secure greater economy in operation without loss in efficiency or hampering the improvement of existing forms of electrical apparatus or the development of new forms suitable for mine service.

The success of the work of committees will, however, always be limited unless it receives the sincere endorsement and active cooperation of the mine engineers.

TO CONFER ON ECONOMY IN MINING OPERATIONS

Mining Men Will Discuss Improved Methods At Standardization Conference to be Held at Cleveland, October 9-14, in Connection With Annual Convention of American Mining Congress—Progress Already Made Will Present Itself For Review

By E. R. COOMBES

THE CHIEF FACTORS contributing to the cost of mine production are the cost of labor and supplies. Primarily, labor is the greatest factor in this cost. In order to maintain the high standard of wages for the American working man, and at the same time meet the competition which exists in the mining industry, it has been necessary for operators to take advantage of, and install, wherever possible, every practical labor-saving device.

The problem of reducing mining cost was made a special study by the larger companies and their success led to the general movement for standardization — or simplification — of mining methods, practice and equipment.

There were many agencies investigating the subject, all working independently, with no attempt at coordination, and while each agency was doing excellent work, there was unavoidable duplication, and disagreement.

CHAS. A. MITKE
Chairman, Metal Mining Branch, Standardization Division

The American Mining Congress attempts to be the "common denominator" —the impartial agency where all may meet for the working out of problems of interest to mining.

It represents, primarily, the mine operator, whose approval must be gained before any definite policy can be found in regard to standards, or any other important subject, affecting his industry. Through its Manufacturers Division it represents the manufacturer of mining machinery and equipment—who must make the equipment it is desired to standardize. Its membership includes large numbers of engineers—who must use the standardized equipment and who must approve the simplification of methods and practice. It is in constant touch with government agencies that are doing a vast amount of research upon this subject. Its membership is interlocking with those national associations which have committees that are studying the problem.

It was, therefore, decided at the 22nd Annual Convention of the American Mining Congress, held at St. Louis, Mo., in 1919, to create within the organization a section to be known as "The Standardization Division."

The First National Standardization Conference was held in conjunction with the Twenty-third Annual Convention of this organization at Denver in 1920. The work of the division during its first year was devoted entirely to the coal mining industry, and attracted such wide and favorable attention that at the Denver meeting metal operators formed a Metals Committee. The division then divided its work into two branches — Coal and Metal—with various sections devoted to special subjects.

The Second National Standardization Conference was held in conjunction with the Twenty - fourth Annual Convention of the American Mining Congress at Chicago, Ill., in 1921. This conference demonstrated completely the urgent need for such a movement, and showed the intense interest, not only of mine operators, but of mining engineers, the United States Government, and those National Associations having committees working upon and interested in those subjects which are included in the scope of the work of the Standardization Division.

The report of the Second National Standardization Conference, of which 3,000 copies have been printed and distributed, includes recommendations for standards upon the important subjects of:

Drilling Machines and Drill Steel.
Underground Transportation.
Fire Fighting Equipment.
Steam Shovel Equipment.
Mine Ventilation.
Mechanical Loading Underground.
Mine Accounting.
Mine Timbers.
Power Equipment.
Underground Power Transmission.
Outside Coal Handling Equipment.
Mining and Loading Equipment.
Milling and Smelting Practice.
Safety Codes.

COL. WARREN R. ROBERTS
Chairman, Coal Mining Branch, Standardization Division

Authorities As Leaders

Mr. Charles A. Mitke, Consulting Engineer, of Bisbee, Arizona, is chairman of the Metals Branch of the Standardization Division. Mr. Mitke is a well recognized authority upon metal mine standards and has written several books pertaining to it. He is regarded by metal mine operators as the most authoritative source of information concerning the standardization of mining methods, practice and equipment, in metal mines.

Col. Warren R. Roberts, Pres., of Roberts and Schaefer Company, Chicago, Ill., is the chairman of the Coal Mining Branch. Colonel Roberts has made a study of mine equipment for a period of more than twenty years. During the World War he served with the Quartermaster Department in Washington and rendered conspicuous service in his work in the standardizing of Army equipment.

A general call will shortly be issued by the American Mining Congress for the Third National Standardization Conference, which will be held in conjunction with the Twenty-fifth Anniversary Convention of that organization at Cleveland, Ohio, October 9 to 14, inclusive.

The report which will be rendered to the Convention at Cleveland will be one of its most outstanding fea-

tures. One whole day, October 13, will be devoted exclusively to the discussion of the work of the Division and to addresses by prominent mining men, mining engineers, government officials, and international authorities. Invitations have been extended to the Secretary of War to speak upon "What the War Department Has Done in Standardizing Army Equipment"; to the Honorable Reed Smoot, who has been making a study of government reorganization, upon "The Elimination of Duplication of Effort in Government Departments"; and to Dr. P. G. Agnew, of the American Engineering Standards Committee, upon "National and International Standardization." Dr. Agnew has made a wide study of this important subject in both this country and abroad and has spent many months in Europe studying the subject there.

Both Colonel Roberts and Mr. Mitke will make special addresses upon the general subject of standardization and each will have an important message for the mine operator.

Few Set Addresses

It has been felt that at the Twenty-fifth Annual Convention, and the Standardization Conference, as it applies to that convention, we should, as far as possible, eliminate set addresses and devote most of the time to a discussion of the obvious business of a standardization conference, i. e. Standardization. It is planned to have all of the reports from the various committees printed in advance and ready for distribution at the meeting. The chairman of each committee will then take up the salient points of his paper for discussion. We are hoping in this way to secure the best thought of the industry upon the recommendations made, and to adopt those standards which will, as nearly as possible, meet the ever-growing requirements of mining companies throughout the United States for the lessening of operating costs.

What will be of special interest and value to those who attend the Standardization Conference will be their ability to see a practical demonstration of the recommendations made by this committee in the labor-saving, cost-reducing equipment, which will be exhibited by the leading manufacturers of mining machinery and equipment, through the National Exposition of Mines and Mining Equipment, to be held in conjunction with the convention. More than 150 companies catering to the mining industry will have on exhibit their machinery. Many of the firms who are exhibiting have special representatives serving upon the various sections of the Standardization Division, representing the manufacturers of equipment thereon.

Full Representation Important

It is highly important that mining companies have at least one representative at the Standardization Conference, and especially important that each company have their engineers present, in order that the conference may adopt such standards as will be of the greatest economic value to the industry. The Convention sessions and the Exposition of Mines and Mining Equipment will both be held in one building, the beautiful new auditorium—the Public Hall—at Cleveland, Ohio. This feature will be of special advantage and importance to those who attend the Standardization Conference.

A program is being arranged that will be of vast significance to the final recommendations for permanent standards. An announcement, with definite program outline will appear in the October issue of the Mining Congress Journal.

ENERGY RESOURCES OF UNITED STATES RAISE NATION TO LEVEL OF GREATEST POWER

MEASURED BY ITS energy resources, which gauge the power of a nation far more accurately than its man-power strength, the United States is literally the most powerful country in the world, according to a statement made by Dr. Thomas T. Read, of the Federal Bureau of Mines, before the School of Foreign Service of Georgetown University.

"The modern way to use the energy of a man is to employ it in a way similar to the little detonator of the big explosive shell," said Dr. Read, "the little charge sets off the big one and does an amount of work far in excess of its own capacity. The energy output of an average workman is about a tenth of a horsepower.

"The energy expended by a coal miner in an 8-hour day thus amounts to about that available from 2 pounds of coal. A Japanese miner, who gets out 1,400 pounds of coal a day, thus multiplies his energy by 700. It is somewhat like planting one grain of wheat and having 700 grow from it. The American miner gets out 8,800 pounds of coal in a day and so multiplies his energy by 4,400. There are 41 million wage earners in the United States, and their energy output is a little over 4 million horsepower, or only 9 times the potential energy output in the form of coal, of 100 miners. The power minerals, coal, petroleum, and waterpower are, therefore, the real sources of strength in an industrial civilization.

"Just where the United States stands on this basis is best brought out by some comparative figures, which may be stated in millions of horsepower years, so that the figures will be easier to handle. Taking the estimates of probable and possible available coal, petroleum, and water-power in the principal countries of the world, and reckoning them in terms of millions of horsepower years, they line up something like this:

ENERGY RESOURCES

Country	Coal (Millions of Hp. yrs)	Petroleum (Millions of Hp. yrs)	Waterpower (Millions of Hp.)
United States	500,000	400	37
China	200,000	60	20
Germany	48,000	2	2½
Canada	40,000	40	22½
Great Britain	27,000	(?)	1
Australasia	19,000	(?)	4
Russia	17,000	280	16
Poland and Czechoslovakia	14,000	45	1
India	11,000	70	27

BUREAU OF MINT ISSUES 1921 METAL STATISTICS

REFINERY PRODUCTION of gold in the United States in 1921 amounted to 2,422,006 ounces, valued at $50,067,300, and the corresponding output of silver was 53,052,441 ounces, valued at $1 per ounce under the Pittman Act, according to a report issued jointly by the Bureau of the Mint and the Geological Survey. As compared with the 1920 figures, these totals show a reduction of $1,119,600 in gold production value, and 2,309,022 in silver production. Production by states is given as follows:

	Gold		*Silver*
	Ounces	Value	Ounces and value $1 per oz.
Alabama	4	$100	4
Alaska	386,927	7,998,500	753,999
Arizona	160,498	3,317,800	2,519,200
California	728,590	15,061,300	3,606,708
Colorado	355,459	7,347,800	6,310,694
Georgia	53	1,100	3
Idaho	26,229	542,200	7,200,319
Illinois	.....	.....	1,616
Maine	9	200	.....
Michigan	.....	.....	316,551
Missouri	.....	.....	63,470
Montana	83,476	1,725,600	9,677,020
Nevada	155,791	3,220,500	6,998,774
New Mexico	9,824	203,100	579,374
North Carolina	82	1,700	13
Oregon	39,454	815,600	53,118
Pennsylvania	24	500	1,707
South Dakota	315,550	6,523,000	111,670
Tennessee	241	5,000	106,664
Texas	116	2,400	548,827
Utah	91,636	1,894,300	14,028,661
Virginia	29	600	8
Washington	7,309	151,100	147,584
Wyoming	.....	.....	65
Philippines	60,705	1,254,900	26,392

TAX REFORM DEMANDS PUBLIC ECONOMIES

Huge Expenditures and Increasing Indebtedness are Straining Nation's Purse—Business Needs Breathing Spell Which Cannot Come Until Tax Burden is Lightened—Protest Lodged Against Tax-Consuming Agencies

By McK. W. KRIEGH

FINANCING NEW projects and promoting new schemes which involve large public expenditures and increased public indebtedness are straining the nation's fiscal resources to the breaking point. It is my conviction that business in general, and the mining industry in particular, needs, more than anything else, a breathing spell in which to regain its footing. The condition of affairs which taxpayers generally have protested against and which is giving the mining industry deep concern, is the orgy of spending public funds which has seized state and local governments. The war obligations constitute a continuing charge against federal revenues which must be met. Payment of interest and curtailment of principal should not be postponed.

No taxpayer can consistently object to making his just contribution to the budget required to carry on the necessary collective enterprise of government. But while the federal government has been endeavoring to curtail expenditures and reduce the tax burden, the revenue requirements of state and local governments have been increasing steadily until the situation has reached a stage of acuteness that is almost unbearable in many of the mining states. New forms of taxation have been imposed and in the quest for more prolific sources of revenue, local taxing authorities have shown a marked tendency to saddle natural resources with the additional tax levies.

Protest Set Forth

The resolution adopted at the Western Mining Conference held recently at Denver under the auspices of the American Mining Congress, protesting against the tax-consuming agencies which are continually seeking to add to the burdens of taxation, was not intended to be used as propaganda against any part of the necessary cost of government which the mining industry should bear; but it constitutes a most emphatic protest against unfair treatment. It relates to the imposition of special taxes on natural resources with which many of the mining states are garnishing the general property tax. The general property tax is the meat which sustains the government. The special taxes provide the garnishment which is wasted. A variety of forms of supplemental taxes are being introduced into the systems of state and local taxation which tend to shift to the natural resource industries public obligations which, under present conditions, would not be incurred if the burden had to be spread over all taxable resources alike, agriculture as well as mining, stock-raising as well as manufacturing, trading as well as transportation.

With industry bearing the handicap of constantly increasing federal and state taxes, all corners of the country are raising a cry for tax reforms.

Generally these demands for a lightening of the burden bear the expression that changing this tax law or repealing that one will remedy the situation. In a minor way, amendments and modifications of the existing statutes would prove beneficial; but the real aid cannot be invited to exert its force until national and state extravagances cease.

When economy governs the hands that sign the vouchers in the public's name, then small time will be devoted to consideration of taxation systems, for then they will not be oppressive.

Watch the expenditures and the finances will largely take care of themselves.

It is useless to entertain the false hope that silence on this vital issue will best serve the interests of the mining industry. It is necessary only to note the inroads which special tax laws are making into the fiscal structures of state and local governments. Examples may be found in the Oklahoma gross production tax, the Louisiana severance tax, the Texas gross receipts tax, the Alabama tonnage tax, the Pennsylvania anthracite tax, the Minnesota occupation tax, the Arizona and West Virginia systems of valuation, all of which impose upon the mining industry taxes which are not borne by any other favored industries, and which have increased disproportionately the burden of mine taxation.

Taxing authorities of other states are studying these plans, and are ready to seize the first opportunity presented to make similar changes in their tax laws, notwithstanding the fact that they can do no greater service for the common good than to permit business, and especially the mining industry, to recuperate and retrench for a few years. Instead of this, we read in the May bulletion of the National Tax Association that such forms of taxation are not only "justified primarily as a regulatory provision of public policy," but that they are "further warranted as a purely fiscal or revenue agency, supplemental to or as the complement of the antiquated and inadequate general property tax." This is the view of many who are willing to have the tax burden shifted to the natural resources industries. This is the erroneous view of many taxpayers engaged in other industries who consider their taxes an affliction, the presentation of a tax bill an outrage, and the shifting of any part of the burden to a particular class or industry a desirable accomplishment.

Apparent for Years

It has been apparent for some years that taxation revenues would be far from sufficient to maintain the increasing rate of governmental expenditures; but instead of regulating expenditures in proportion to the reasonable amount of taxes available, state and local governments have extended their operations and enlarged their agencies on borrowed money which, of course, ultimately must be paid by the taxpayers. Official statistics show that between 1913 and 1919 the bonds or funded debt of the states had risen from $364,000,000 to $625,000,000, almost double; that in cities with a population of 30,000 or over the bonded indebtedness had increased from $2,489,000,000 to $3,904,000,000; that during the same period there was a similar increase in municipalities under 30,000 population and in counties and other civil divisions; and that from 1913 to the present time public indebtedness, not including indebtedness of the federal government, had increased from $3,834,000,000 to an amount estimated at approximately $10,000,000,000.

If state and local governments had been forced to depend upon taxes to cover the cost of new undertakings and growing disbursements, taxpayers would have been aroused early to a realization of the disastrous consequences in prospect before the matter passed beyond their control; but the ease with which bonds were marketed must have lulled them into an attitude of security. The idea seemed to prevail that they were getting something for nothing, and that in any event the additional burden would be borne by special taxes on some par-

ticular class which would not affect the people generally.

A Rude Awakening

With the depression following the war came a rude awakening. Taxing authorities are finding that present business conditions preclude special levies which would tend to tax an industry out of existence, drive capital from the state, and otherwise impair the state's taxable resources. Thus, it has become necessary to seriously consider the problem of equitable distribution of revenue requirements, and to evolve a plan of making this distribution in a manner that would cause the least disturbance politically. The proposition presents many difficulties, and drastic curtailment of expenditures must be accomplished before its solution will be possible.

Discriminatory taxes should not be tolerated, irrespective of which class of taxpayers or kind of industry would be most seriously affected; and any system which stimulates waste of natural resources and destroys incentive for their conservation naturally calls for severest condemnation. There seems to be a tendency abroad to ignore the hazards of mining and the fact that, until the investor in a mining venture actually receives back in cash or its equivalent the amount of his investment, there is no positive assurance that the investment will be profitable, and that taxes upon mines in countless instances have been taxes upon capital investment because operations have proved to be unprofitable. Since such considerations have been cast aside, it is not difficult to understand why other considerations, particularly the principle that taxes should be equitably apportioned, are also forgotten or ignored in the scramble to "get while the getting is good." My study of the situation has led me to conclude that the taxing powers of a state should be limited by its constitution, otherwise no industry can be held immune from unfair and discriminatory taxation.

Situation Still Unremedied

Recent so-called tax reforms have not remedied the situation; but have increased the burden on taxpayers and have led to profligacy in the disbursement of public funds. High taxes and other high costs have forced selective mining, over-production, and rapid exhaustion of mineral reserves, and thus are rapidly reducing the tax base upon which States must depend for their revenues for many years to come. These are unpleasant facts which public officials have to face, and the only conclusion that can be reached by any unbiased student of conditions is that the real tax reform of the immediate future will be the one which points the way to decreased public expenditures.

NON - FERROUS CONDITIONS ARE BETTER, SAYS BOARD

THE BUSINESS situation of the country, as reflected in an analysis made by the Federal Reserve Board, shows a brightening of the path ahead of the non-ferrous metal industry. In summarizing contents of reports by its experts throughout the country, the board finds the favorable position of the non-ferrous industry so obvious as to command special comment.

The point is developed that an increasing production of the non-ferrous metals has not lowered the average selling prices. In this is seen a favorable indication of the ability of the market to absorb more of these products.

Although copper has displayed the greatest amount of ability to recover from the effects of period of depression, the board's economists note that zinc also is rapidly improving its position.

METALLURGICAL MILLING WORK TO BE STUDIED INTENSIVELY

OUTSTANDING PROBLEMS in metallurgical milling work are to be advanced towards solution under a research program just inaugurated by the Bureau of Mines under the supervision of Prof. E. A. Hersam of the University of California at the Massachusetts Institute of Technology, in cooperation with the milling committee of the American Institute of Mining and Metallurgical Engineers. This investigation will have among its objects the increasing of efficiency and decreasing of costs in pulverizing ores, the increasing of efficiency in screen and improvement in an enlargement capacity of classifiers.

Before any definite research is taken on this problem, however, it is intended to make a preliminary survey of the industry to determine just what phase of the problem should be taken up first.

An informal discussion concerning the extent of the field of milling to be included in the research was recently held by California members of the Institute's milling committee, and was attended by D. A. Lyon, Chief Metallurgist of the Bureau of Mines. Discussion centered upon the grades of crushing and the distinction between coarse and fine crushing. It was the general opinion that the size of two inches was the line of demarkation between coarse and fine crushing, but extension of this understanding into further classification was not considered.

MINING IS ANALYZED IN CENSUS REPORTS

INTERESTING COMPILATIONS of statistics relating to the various branches of the mining industry are included in a number of reports recently issued by the Bureau of the Census incorporating data gathered by the 1919 census.

These reports include the following subjects: Gold, silver, copper, lead, zinc, coal, iron ore, refined petroleum, stone, phosphate and gypsum. Each report enters into the following details:

General summary of producing and nonproducing enterprises, in each industry; principal statistics by geographic divisions; mining regions; distribution of metal-mining industries by mining regions and states; rank of states; comparative summary for producing enterprises; comparison of quantity of products; comparison of value of products, by regions; power used per enterprise and per wage earner; character of organization of each industry; size of enterprises according to value of products; size of enterprises according to average number of wage earners employed.

Size of enterprises according to acreage of mineral land; persons according to class and sex; wage earners, by occupations; wage earners, by months; days in operation; prevailing hours of labor; land tenure; royalties; power equipment used; comparative statistics for power; classes of placer mines according to mining method; classes of lode mines according to treatment of ores; fuel used by each industry; detailed statistics by states. Many maps also are included.

LAND OFFICE REVIEWS ITS WORK ON LEASES

IN REVIEWING its activities under the leasing law during the month of July the General Land Office reports 293 new applications for permits. Consideration was given during the month to 1,447 applications, of which number final disposition was made of 730, by 283 permits granted, 107 applications finally rejected and closed, 66 rejected in part, 232 rejected subject to the right of appeal, 27 transmitted to the secretary on appeal. On cases heretofore appealed, decisions in the department were rendered, resulting in 16 being affirmed, 8 reversed and 8 modified. The secretary also approved 11 assignments of permits. Preliminary action was taken on 535 applications. Extensions of time were granted on 160 applications. Cancellations of 7 permits were issued, 1 permit cancelled in part, 15 entries were cancelled and 2 entries reinstated.

TAXATION OF MINES TO BE ANALYZED

Leaders of Industry to Discuss Situation at Cleveland—Constant Tendency on Part of Nation and States to Increase Demands on Industry to Magnetize Attention—Conference Will Consider Future Fiscal Moves by Government

THE conference on taxation of mines, to be held at Cleveland, Ohio, in conjunction with the 25th annual convention of the American Mining Congress, October 9-14, will be featured by papers on questions of Federal taxation prepared by members of the Standing Committee on Federal Taxation. This part of the program has been designed to develop discussions of facts upon which resolutions can be framed urging changes in the procedure of the Bureau of Internal Revenue which will bring about speedy, just, and final settlement of the thousands of pending tax claims, according to preliminary announcement issued by the Tax Division of the Mining Congress.

Study of State Taxes

The investigation of state and local taxation of mines, authorized by a resolution of the 1921 convention has not been concluded, and the central unit of the special tax committee handling this work has recommended that action on this subject be deferred until complete data has been secured. It is therefore planned to recommend the continuance of this committee for at least another year. The policy of the committee with reference to the scope of the discussion of state taxation of mines cannot be announced in advance of the meeting of the National Tax Association to be held at Minneapolis, Minn., September 18-22, at which this subject will be considered.

Early assurances have been received that this conference will bring together one of the most representative groups of men interested in mine taxation yet assembled. So complicated have taxation matters become during the three years immediately following the war, that problems related to this subject are making greater demands for solution than ever before. It is in the realization of this condition that tax authorities and representatives of hundreds of mining companies will be in attendance at the conference.

Field of Discussions

The discussions will cover the important phases of invested capital, and the provisions of the law and regulations relating to special relief, net losses, depletion, valuations, interest, compromises, and many other subjects.

An excellent opportunity will be offered for the mine auditor, accountant, controller or tax consultant to exchange views and discuss individual problems with others who have handled similar problems. The program is being designed to furnish information of great value to companies who have suffered delay and hardship in the determination of tax liability.

Coal companies have had a great deal of difficulty in securing adequate valuations and proper allowances for depletion in the determination of their Federal taxes. The adjustment of their income and excess profits taxes presents as serious problems at the present as during the past three years, and it will be some time before the thousands of cases now pending are finally settled. Many representatives of coal companies will attend the conference, and special attention will be devoted to their interests.

PAUL ARMITAGE
Chairman, General Committee on Taxation, American Mining Congress

Timely Character Indicated

The preliminary announcements made by the Tax Division of the American Mining Congress in connection with the program for the conference indicate the timely character and general interest held by the subjects chosen for discussion, and present a list of notable authorities on taxation matters as leaders of the work of the conference which will precede the framing of resolutions.

Included among the leaders of discussion who have definitely accepted places on the program are Robert N. Miller, who will present a paper on the Special Relief Sections; George E. Holmes, who will address the conference on the various phases of invested capital; Paul Armitage, who will discuss taxability of dividends distributed from depletion; R. C. Allen, on valuations used in computing Federal taxes; T. O. McGrath and H. B. Fernald, who will lead the discussion on mine accounting methods in relation to Federal taxes. Other members of the Special Tax Committee of the American Mining Congress will take up questions of interest on deficiencies and refunds, compromises with the government, and procedure since the reorganization of the income tax unit.

Paul Armitage, chairman of the Standing Tax Committee of the American Mining Congress, will preside at the conference.

In addition it is proposed to take up in the general discussion questions relating to depreciation, obsolescence and amortization.

To Consider the Future

The conference will take cognizance of the possibility that further complexities will arise in connection with any return of abnormal prosperity. Although the repeal of the excess profits tax eliminates the question of invested capital for 1922 and subsequent years, such an era of prosperity might bring about some form of taxation under which invested capital might again become an important feature of the law.

The possibility of securing an amendment to the 1921 law which will enable mining companies who sustained losses in 1920 to set such losses off against profits of subsequent years or for the year 1919 also will be considered.

October 10 and 11 have been tentatively fixed for the sessions of the conference. Plans are being made to insure absence of interference between these sessions and those of the convention of the American Mining Congress, which will extend from October 9 to 14.

Past conferences on mine taxation have proved beneficial to the mining industry. The discussions have resulted in a clearer understanding of principles of taxation as applied to natural resources, and have dispelled many erroneous theories which have warped public opinion. The growth of these conferences and the unusual interest being manifested this year give practical assurance of future benefits to be derived.

VALUE OF POWER PERMITS CUT BY DECISION

Preliminary Papers Issued by Federal Power Commission Are Not Basic Agreements, Says Attorney General Daugherty—Opinion Holds that Government Can Impose Additional Conditions Before Granting License

PRELIMINARY PERMITS issued by the Federal Power Commission are practically worthless so far as binding power upon the government is concerned. This is the indication drawn from interpretation of a recent opinion by Attorney General Daugherty, which was rendered by that official as an answer in the affirmative to the following questions addressed to him by the Commission:

1. If a preliminary permit is first issued and such permit is to be followed by license, can conditions be inserted in the license which were not expresesd directly or indirectly in the preliminary permit?

2. If a preliminary permittee has complied with all the provisions, directly or indirectly expressed in his permit, which are conditions precedent to issuance of license, and if he is also willing to accept a license containing all the provisions directly or indirectly expressed in his permit, which are to be conditions of such license when issued, has the Commissioner authority to refuse to issue a license or to make its approval condition upon acceptance of other or additional provisions?

May Jeopardize Capital

Close observers of the situation believe that this opinion will place an unbearable handicap upon those who seek to develop power projects. Applicants having no guarantee in their preliminary permits as to the conditions which may be insisted upon in the license will hesitate to incur expenditures in preliminary work under the permit.

Immediately after the opinion was rendered it became apparent that efforts would be made to amend the act creating the Federal Power Commission in such a way as to make the conditions of the preliminary permit binding upon the government to the extent that the federal authorities could not insert new conditions in the final license as they are authorized to do by the Attorney General's opinion.

Because of the growing importance of water power development as related to the mining industry of the country, especially in the West, these developments are seen in the light of holding a vital bearing upon the operation of the industry, particularly in the future, when more and more dependence will be placed in water power as an asset in mining operations.

An important possibility in connection with this opinion is that it may vitally affect the application of James B. Girand for a license covering a power development on the Colorado River. Action by the Commission on Mr. Girand's application is being withheld pending determination by the Colorado River Commission of a general policy for utilizing the resources of the river. Interest is centering in the effect which the Attorney General's opinion will have upon the "rights" embodied in the preliminary permit granted Mr. Girand, which has been extended to November 30, the time limit being advanced to cover the meeting of the Colorado River Commission soon to be held at Santa Fe, New Mexico. Many close students of the situation are of the opinion that Mr. Daugherty's opinion will not cause a change in the status of Mr. Girand's claim of right to carry on his proposed development at Diamond Creek. This view is based upon the fact that Mr. Girand initiated his first steps in connection with this activity several years before the Federal Water Power Act was passed, and that rights which he obtained by this early action, which are recognized by the act, are so basic as to be beyond the government's ability to controvert.

In some quarters it is believed that the Commission submitted these specific questions to the Attorney General partly for the purpose of gaining guidance for action to be taken on the Girand application after the Colorado River Commission has formulated its definite policy and the relationship of the Diamond Creek project to development of the Colorado River's potential power reserves as an entirety.

Language of the Opinion

In his opinion, the Attorney General declares "it is clear that the license is the final and effective instrument which is to regulate the rights of the public and the party developing and operating the project.

"The permit," he continues, "as its name indicates, is merely preliminary, temporary, and for a single purpose. The determination as to what conditions the license shall contain involves to a very high degree the exercise of judgment and discretion; and I find nothing in the law to indicate that the Commission will or can exhaust its judgment and discretion in seeking the terms of the preliminary and temporary instrument.

"If it has happened that the Commission, in formulating any particular preliminary permit, has in fact set forth so fully and completely the terms and conditions to be embodied in the license as to make it seem unfair or unconscionable, after the permittee has expended time and money in formulating plans on the basis of those conditions, to add new and more burdensome ones, the situation presented will be one which the Commission will meet, of course, in a just and equitable manner. With that, however, I have nothing to do."

The Attorney General's opinion directly reverses that of Major Lewis W. Call, chief counsel for the Commission, who answered both specific questions in the negative.

Answering the first question, Major Call's opinion holds that "The permittee is entitled to a license upon the conditions set forth, either directly or indirectly, in the preliminary permit.

It should be observed "that the preliminary permit is issued in accordance with the provisions of the Federal Water Power Act and the regulations of the Commission issued thereunder, and that these form a part of the preliminary permit. Whatever conditions are prescribed in the statute or in the regulations, although not specifically set forth in the preliminary permit, are, I think, as set forth by reference within the meaning of the Act." Major Call's reply to the second question also is embodied in this language.

FEDERAL POWER REQUESTS

THE ANACONDA Copper Mining Company, Anaconda, Mont., has applied to the Federal Power Commission for a license to operate a project at the Georgetown Lake dam now under Forest Service permit, the work already having been done.

The Southern Sierras Power Company has applied for a license for a distribution line from Edom, Calif., across the Aqua Caliente Indian Reservation and certain patented lands.

Walter C. Brower, of Spokane, Wash., applied for a preliminary permit for a concrete dam in Phanton Creek and Blue Grouse Creek with pipe lines and a power house and auxiliary works in the Cour d'Alene National Forest, Kootenai County, Idaho, all for the purpose of providing power for mining projects.

WAR MINERALS CLAIMS UNDER LIBERAL POLICY

Secretary Fall Approves Plans To Hasten Action—Will Eliminate Examinations by Engineers Whenever Possible.—Outcrop Work Can Be Basis for Claim, Even Though Valueless Later—Corporate Interest Cases Analyzed

SECRETARY FALL has placed his approval upon new policies for administration of war minerals relief claims. These policies provide a general rule to be followed in determining the commercial importance of the mine, and outline a program under which functions of engineers in the field are to be performed with fullest efficiency.

The government officials working with the Minerals Relief Commission hold that, although the facts of each case must govern, it is possible to lay down a general rule for determining commercial importance under which each case can be decided on its own facts.

From General Rule

A liberal interpretation of the law in administration of claims before the commission is indicated in the official views expressed in the following language:

"It would seem that if developments on adjoining properties, surface or geological indications, outcroppings, discovery pits, etc., contained a sufficient showing to warrant a prudent miner in the hope that he would develop a mine of commercial importance, and he did thereafter perform work and extract some of the ores named in the act therefrom, which extracted ores had a commercial value, that his claim is entitled to consideration under the War Minerals Relief Act, even though it may subsequently develop that the vein pinched out or that the deposit was in the nature of a profit and in light of subsequent developments cannot be rated as a commercial mine."

A Direct Application

Direct application of this policy has been made to the claim brought by the Sulphur Gulch Manganese mines which has been found to be allowable after previously having been denied on the grounds that the mine produced only from thirty to fifty tons of ore and did not contain ore in commercial quantity. The claimants having first secured the opinion of mining engineers that outcroppings on the surface indicated a likely mine bought a lease and performed work upon the property. Although under the commission's rule the money expended for purchasing the lease is not allowable, the claim has been approved in so far as actual operating costs are concerned.

The most important point in the new policy relating to activities of engineers in the field is found in embodiment of Secretary Fall's view that he does not think it necessary to incur expense of an examination of small claims, certainly not of claims for less than $1,000, where record facts can be ascertained otherwise. The secretary has stated positively that he does not believe that it is necessary to make as minute an examination of the claims as has been the practice under the old commission. A case having been presented by the applicant's sworn statement, corroborating by the statements of others, vouchers, and other evidence, the engineer's examination, is largely to corroborate or check up on the showings and allegations of the application and a rapid and comprehensive examination rather than one going into minute detail is all that will be required, in the view of the secretary.

Urges Speed In Work

In brief, the secretary desires a liberal policy pursued and also that examination of claims be completed as soon as possible. Suggestions from the secretary to this effect are understood to have been forwarded to the commission and with the view that the engineers proceed along these lines and endeavor in every way to expedite the disposition of pending claims.

Many interesting points in connection with administration of claims before the commission also have been brought out by argument in recent hearings involving cases in which the issue of corporate ownership of more than one war minerals operation is an important factor.

Speaking of cases where recompense has been sought for what are claimed to be losses in the operation of going concerns being operated at the time of supposed or actual stimulation to increase outputs, Secretary Fall declares that "the claimant being engaged in production already, and presumably earning a profit at the time, it is, in the absence of direct evidence and clear proof to the contrary, ordinarily to be assumed that if he attempted an increased output through merely enlarged operations of the same properties, he was 'induced' so to do largely because of war prices of the product.

"Upon the other hand, evidence may show that in the operation of this property, being operated at the time of the actual or supposed 'stimulation,' the party was 'induced' to extend his operation beyond the point to which he would have been 'induced' to extend same, merely because of 'war prices' by official 'stimulation' under which he understood that he was guaranteed against loss in such increased expenditure.

"Upon the one hand he would have known that he was taking chances upon these 'war prices,' ending with or before the termination of the war, and that consequent losses of additional investment, etc., would have been solely his.

The Balancing Factor

"Upon the other hand, he may have been assured by the action of the government and its officials, that, even in the event of losses through such early ending of the war and the immediate decrease of prices of his product, that he would be held free of losses through direct compensation by the government."

Taking the Santa Margarita case as a specific illustration, the Secretary's views are outlined in the following language:

"If this party, operating a then going concern at a profit on ores from a certain mine or mines, is 'induced' either to build roads to bring to market the ores which would bear shipment, that is, we will say, the 40 percent ores, or is 'induced' upon the other hand, to erect concentrators or other machinery, and to abstract ores running 15 to 18 percent, or less, thus converting three tons of rock into one ton of 40 percent concentrates, at necessarily a very much greater cost than the extraction of one ton of 40 percent ore; and in such concentration and low grade production more or less heavy losses were incurred, it appears to me plain that the party was not 'induced' to enter into such enterprise because of the hope of 'war prices' for his product, but because he must have understood that he had some guarantee against loss in an enterprise which he, as a business man, had not entered upon, although the opportunity may have offered itself for many years past.

"It would seem clear to me that this party was so 'stimulated' by a desire to answer the call of his government, and because he understood that his government would relieve him from actual loss in the business.

"It would then be clear to me, in such case, until contrary facts are definitely established, that the profits in the original operation, or business in which this

party was engaged and had been engaged before the war, should not be charged against this 'stimulation' business, at least unless the two operations were so inextricably confused, not only by methods of accounting, but by mechanical confusion of the ores extracted, operation, sales, etc., that the profits and loss could not be ascertained."

Indicated action was taken upon the following claims during the period between July 15 and August 19:

AWARDS RECOMMENDED BY COMMISSIONER

Western Rock Properties. In this case Secretary Finney held that where several operations are concerned, the profits of one, which was unrequested and non-stimulated, should not be deducted from the losses of other mines operated by the same company. Partially reversing the action of the commissioner, the secretary made an award of $46,542.46 to the above-named company.

Pruitt, Conway & McGlawn, Atlanta, Ga.; additional award of $3,740.62 recommended. Affirmed by secretary.

I. J. Matheny, Batesville, Ark., $421.60 recommended. Affirmed by secretary.

E. H. Bartholf, Colfax, Cal., $1,222.87 recommended. Affirmed by secretary.

Samuel Altshuler, San Francisco, Cal., $1,604.56 recommended.

E. C. Hosner, Lone Pine, Cal., $744 recommended.

Triangle Mining Co., Salt Lake City, Utah, $1,590.63 recommended.

Estate of Herman and William Rich, Canton, Ga., $10,605.52 recommended.

DISALLOWANCE RECOMMENDED

M. W. Mouat et al., Nye, Mont., no additional award.

S. E. Langford, Salt Lake City, Utah, claim of no commercial importance.

F. A. Lawson, San Francisco, Cal., claim not within the act.

F. S. Miller, Gush Nichols and T. F. Nichols, Medford, Oregon, no stimulation established.

Matt Cronin, Gold Hill, Utah, claim not within the act.

A. J. Schmidt, Oakland, Cal., claim not within the act.

PETROLEUM INDUSTRY'S PROFITS NOT LARGE, SENATE BODY IS TOLD

DECLARING that the profits of the oil industry during the past two years have been comparatively small, R. L. Welch, secretary-manager of the American Petroleum Institute, recently furnished testimony which featured hearings before the Senate subcommittee on manufactures charged with investigation of gasoline prices and oil production stocks, etc., under the McKellar-LaFollette resolution.

Mr. Welsh said in part:

"The explanation lies in two facts:

"First, to produce one barrel of gasoline it is necessary for the oil industry to produce about four barrels of crude and by-products. The principal by-product is fuel oil, which is sold at all seasons of the year at prices below even the cost of crude at the wells.

"Second, the burden of cost must therefore be borne by the principal product—gasoline. But, even as to this product, more is produced during the winter and early spring months than is consumed, and during this period the financial necessities and lack of storage facilities of many refiners compel them to sell below the cost of production.

"The crude oil of the United States and Mexico is produced to meet the demand for gasoline. In 1921 it took a production of nearly four barrels of crude oil to produce one barrel of gasoline.

"The domestic production of crude oil in 1921 was 469,693,000 barrels, and 125,000,000 barrels were imported from Mexico. Of the total of 594,639,000 barrels, 66,000,000 barrels went into storage, indicating that 528,639,000 barrels of crude were either refined or sold as fuel oil without refining.

"The crude oil refined produced 123,000,000 barrels of gasoline, leaving a balance of 405,000,000 barrels to be disposed of in the form of other petroleum products.

"Consumption of gasoline fluctuates more than 100 percent between periods of maximum and minimum demand. On the other hand, refinery operations must be continued on a reasonably uniform basis throughout the year.

"Otherwise the refineries of the country would be 50 percent shut down during periods of lowest gasoline consumption and would be unable to get the demand from current production during the seasons of high consumption.

"Gasoline prices were rising in May and June of this year because of the increase in the demand in relation to supply.

"The best single index of the demand for gasoline is the number of automobiles in actual use.

"The amount of gasoline available in refinery storage on May 31, 1922, for each of the 10,448,632 automobiles registered on January 1, 1922, was 82 gallons, as against an average of 87 gallons for each of the automobiles registered on January 1 of the years 1918 to 1921, inclusive.

"Recently gasoline prices have declined, not because of a falling off in the demand, or anything in the gasoline stock situation itself, but because of a decline in the price of crude.

"Since November, 1921, the oil industry has been producing and importing more oil than was consumed in this country and exported. The excess of production and imports over consumption and exports from November, 1921, to May, 1922, was 70,302,678 barrels."

BUREAU OF MINES SUGGESTS SAFETY RULES

THE FOLLOWING recommendations for the safe-guarding of coal mines and miners have been made by the Bureau of Mines, following examination of the causes and results of numerous mine disasters:

All persons in responsible charge of the direct operation of coal mines—including superintendents, foremen, fire bosses, and shot firers—should be required to have certificates of competency by the state, showing that the applicant has passed an examination clearly establishing his knowledge of what constitutes up-to-date safe practices in the branch or branches of mine operations under his jurisdiction. All such certificates should be revocable by the state for cause, should expire after five years, and should be renewed only upon taking another examination. The latter requirement would compel all operating mining men to keep conversant with progressive safety practices.

Mining companies should require superintendents, foremen, fire bosses, and shot firers to keep thoroughly familiar with requirements of state laws, as well as with up-to-date practices in regard to ventilation, dust, electricity in mines, and explosives. If possible, this information should be conveyed by lecturers or specialists conversant with the best current practices, otherwise the companies should provide for sending current mining literature to its mine officials.

Each mine should make an especial study of its gas and dust conditions. It might be advisable to enlist the services of the U. S. Bureau of Mines, whose coal mining division has made and is making extensive studies as to the prevention of explosives in coal mines.—Reports of Investigations, U. S. Bureau of Mines.

PETROLEUM SUPPLY EQUAL TO COAL OUTPUT DURING STRIKE

THE POTENTIAL supply of fuel oil and kerosene is approximately the equivalent of the output of coal during the week when the strike was at its height. This is the assertion made by the American Petroleum Institute in its efforts early last month to secure approval of an amendment of the I. C. C. priority order under which "petroleum and its products" would be substituted for the "fuel oil" item. The commission refused to make the amendment.

The potential production of fuel oil is about 9,000,000 barrels per week. On the basis of 3½ barrels of fuel oil to one ton of coal this potential production is the equivalent of 73 percent of the entire present weekly production of 3,500,000 tons of bituminous coal. In addition, the refineries can produce 1,300,000 barrels of kerosene per week.

Frederick H. Gillett

Woofing and Warping

X. Speaker Frederick H. Gillett

A Series of Scrutinies Directed Toward Notable Legislative Personalities

By IRA L. SMITH

AS QUIET as midnight and as dispassionate as an ironing board, the personification of gentlemanly dignity presides over the House of Representatives in the form of Frederick H. Gillett. Where Joe Cannon beat the air into a million furies by waving of a rod of iron over cringing heads, the present speaker is content to pour his soft soul into a light tap of the gavel.

This gentleman from Massachusetts combines in his personality the austerity of the New England coast combined with the smile of a sunrise in the Berkshires, or something like that. Moulded in placidity, he has the sort of sang froid for possession of which the gods used to slay each other.

His absolute antithesis is an ice man shouting "Ice!"

Mr. Gillett first ran for Congress just two years after Priscilla put a dent in all New England by telling Jack Alden to toot his own horn. Since that remote day, he never once has been denied and Massachusetts has continued its faith in "Freddie," as Springfield and its environs are wont to dub him.

As the years following his debut passed by—tied trunk to tail like so many elephants in the parade of time—this investiture of things colonial arose in the ranks. And finally the era of czars among the speakers of the House gave way to the more modern order of things, making it possible for someone else than a creature breathing fire to sit in the pulpit-like perch upon which the speaker parks himself while the House is in session. That's how it come that this congenial soul mounted to the rostrum, aided and abetted by the fine array of seniority which the passing days had bestowed upon him.

A kangaroo would be more apt to swear off jumping than Mr. Gillett would be to allow his heart to beat one lone time in sympathy with the party that helped to make Versailles famous. But, withal, he never sheds the cloak of a gentleman, playing so fair a game with the opposing party on the floor that a Democratic verbal bouquet was tossed at him when the last session closed.

Although he is just around the corner from seventy years of age, he is one of the best little swatters of the golf pill that ever had his John Henry on the corner of a franked envelope. He very often takes a tour of the links with a fellow by the name of Warren Gamaliel Harding, whose name was in the paper the other day.

In the off-season when bits of dirt grow hard on golf clubs stowed away in cold attics, Mr. Gillett's Van Dyke often may be seen pointing down toward lines by Emerson, or Longfellow or some of the other chaps whose literary abilities flourished in the bleak chill of New England.

But whether his fingers are reaching for the gavel, gripping themselves around the handle of a golf club or caressing a volume of Wadsworth, he is always the same—a gentleman from Massachusetts.

SHOW-DOWN ON ALASKAN COAL PROBLEM TO FOLLOW STUDY OF MINING COSTS

THE GOVERNMENT is engaged in a determined effort to prove once and for all if mining operations in the Matanuska field can be prosecuted with practicality. Engineers of the Bureau of Mines are computing costs of mining coal in the Chickaloon district, and the results of these computations will form the basis for a decision as to whether the work will be carried on or left without being made the object of further development activities on a large scale.

Due to the badly faulted condition of the veins which were worked by the Navy at an expense of over $1,000,000 in efforts to develop a store of naval coal on the Pacific coast, the Department of the Interior, to which authority over the work was transferred early in the year, has turned its attention to a new location. Diamond drilling now is under way on a site close to the scene of the Navy's operations, where experts of the Bureau of Mines are working under the belief that more practical mining conditions will present themselves.

Regardless of the degree of success attained by the diamond drilling on the new site in proving existence of workable beds, however, the Department of the Interior will not continue the operations if the economic studies now being conducted show that an abnormal expense will be attached. It is not expected that the bureau's experts will make their final reports on the cost of mining within two months. Officials are desirous that these reports shall stand up as accurate guidances for the formulation of future policies and all care will be exerted to eliminate any chance for error, despite the fact that the Department of the Interior is anxious to reach a solution of the Alaskan coal problem as soon as possible.

Meanwhile the Navy is proceeding with its efforts to definitely establish the value of the Alaskan coals as fuel for its ships. The Collier Jason recently arrived at Anchorage to take aboard the 5,000 tons of Chickaloon coal recently treated at the Sutton washery which will go into the furnaces of a battleship at an early date when consumption tests are held. In addition to the coal from the Chickaloon fields, it also proposed to make tests of 600 tons of coal from the Bering River field. John Blizzard, fuel engineer of the Pittsburgh Station of the Bureau of Mines, has been detailed to make technical observations of the steaming tests.

Operations in the sub-bituminous fields along the Healy River are becoming the object of increasing interest, and many authorities are of the opinion that these veins will be responsible for some of the most profitable commercial coal mining in the territory. The Healy River Coal Corp., which is working these deposits, has announced that its work is progressing very satisfactorily and that preparations are being made for erection of the permanent buildings necessary for its operation campaign. Work on the railroad spur to be extended to these fields is making marked progress.

RULES ISSUED TO COVER LEASING WORK

OPERATING REGULATIONS to govern the methods of mining oil shale, phosphate, sodium, and potash on leased public lands of the United States have just been issued by the Bureau of Mines, which is entrusted with the supervision of such operations.

The regulations provide that it shall be the duty of the supervisor and district mining supervisors to visit from time to time leased lands where operations for the discovery or mining of oil shale, sodium, phosphate, or potash are conducted; to inspect and supervise such operations with a view to preventing waste of mineral products, or damage to formations or other mineral deposits; and to supervise operations and conditions for the promotion of the safety, health, and welfare of workmen. Supervisors will submit recommendations for safeguarding and protecting the lives and health of the employees, the property, the minerals, and the mineral-bearing formations.

The lessee shall prepare such maps as in the judgment of the mining supervisor are necessary to show the surface boundaries, improvements, and topography, and the geological conditions so far as determined from outcrops, drill holes, prospecting, or mining.

The underground and surface sanitary, welfare, and safety arrangements shall be in accordance with the recommendations of the United States Public Health Service and United States Bureau of Mines. All employees shall be afforded all possible protection to life and health. All mechanical equipment used for the transportation of men shall be of a safe design. Adequate shelter holes shall be made, guide rails or fences shall be erected, and warning signs shall be posted at dangerous walks or passages; all moving parts of machinery or belts, when endangering employees or liable to result in injury, shall be adequately guarded. In the mining and milling or treating of the ores or mined products, the employees shall be adequately protected from injurious fumes, acids, dusts, and harmful or dangerous conditions. In mines where siliceous or other harmful dusts are formed, drills shall be of the water-injection type and sprays shall be used to wet down the dust.

Lessees shall maintain for each underground operation sufficient amount of ventilation for such men and animals as may be employed therein.

The lessee shall store, thaw, transport, issue, and use explosives only in the most approved manner and with due regard for the safety and welfare of the employees and protection of property.

Mining operations shall be conducted in a manner to yield the ultimate maximum recovery of the oil shale, phosphate, sodium, or potash, due regard being taken to protect with adequate pillars all shafts, main exits, and passageways; also all beds or mineral deposits overlying the deposit being worked that at a future date may be of economic importance.

The regulations also cover the subjects of fire protection, escape ways, electrical equipment, disposal of waste rock, the submission of core or test hole records, and the application of improved milling methods.

Copies of these operating regulations may be obtained from the Bureau of Mines, Washington, D. C.

METAL COMMERCE DIVISION HAS WORK UNDER WAY

THE NEWLY created metal division of the Bureau of Foreign and Domestic Commerce has completed its preliminary organization work and now is entering upon a distinctive effort to lend the government's assistance to the mining industry wherever possible, according to James A. Stader, chief of the division.

Although the division cannot hope to enter into the larger phases of its work connected with aiding the export business of the mining industry until the economic situation in Europe approaches some semblance of solution, much valuable service to the industry is being rendered in connection with requests for information on a wide variety of subjects. Many of these requests are coming from the United States, being addressed by citizens of the United States in efforts to find capital with which development of mining prospects they have located may be taken up. The division also is acting in many instances to establish communication between manufacturers of mining machinery and miners in foreign countries desiring their products.

According to present plans, Mr. Stader will be in attendance at the annual convention of the American Mining Congress to be held at Cleveland, October 9–14, when he will outline to mining men the benefits which the government is placing at their disposal through the metals' division.

HOW TO ESTABLISH TITLE TO OIL SHALE LANDS

Authority Outlines Steps to be Taken—Definite Lines of Procedure Drawn from Experience amd Precedents—Large Variety of Details must be Recognized and Acted Upon If title is to be assured—Increasing Interest in Shale Industry Has Brought Growing Desire of Owners to Patent Properties.

By ROBERT D. HAWLEY

(Mr. Hawley has had probably more experience in the examination of titles to oil shale placers and taking them to patent than any other attorney in the United States. He is a member of the Committee on Legislation, Title and Assessment Work of the Oil Shale Section of the American Mining Congress, and represents, as attorney, Union Oil Company of California, Pure Oil Company, and the Federal Shale Oil Company, in the State of Colorado. He has had charge of the legal work in connection with the purchase and patenting of several thousand acres of oil shale lands acquired by Union Oil Company of California. The following article has been prepared by him by special request.—*Editor.*)

THE OIL SHALE lands in the Mountain States were all, until within very recent times, a part of the unappropriated public domain of the United States. Within the past year or two titles have been secured to some of these lands under the mining laws. The balance of the lands today are still a part of the public domain, or are held by mineral locators under the provisions of the Placer Mining Law. Recent estimates of the petroleum reserves by prominent geologists have called attention to the oil shales of the West as a reserve source of petroleum which will supply the needs of the nation when the wells of the country have become exhausted to such an extent that they no longer produce sufficient oil to meet the demand.

With the increasing interest in oil shale has come a desire on the part of the owners of oil shale placer mining claims to patent their claims, and thus establish their titles in a manner to justify the expenditure of money in large sums upon the lands for the development of the shales. Some of the steps necessary to this end, as shown by our experience, are briefly set down here.

Propositions Affecting Each Case

Five general propositions may be stated, which are pertinent in every case involving shale locations—they are:

First—Oil Shale is a separate and distinct mineral, having its own characteristics, just as gold, silver, lead, etc., are distinct minerals. A discovery of oil shale prior to February 25, 1920, was sufficient to validate a placer location. The Leasing Act of said date effected a withdrawal of all shale lands unappropriated when the law became effective.

Second—Under the Leasing Act of February 25, 1920, the government became an adverse claimant to all oil shale locations. Locators, or their grantees, are bound to stand upon their rights as said rights existed at the time of the passage of the aforesaid act.

Third—While a title in fee to oil shale lands may lawfully be acquired only by virtue of placer locations, yet the character of the mineral requires that the labor to be performed upon the claims be such as would ordinarily pertain to lode locations. The documents in connection with the application for patent must be prepared with this idea in view.

Fourth—Absolute certainty in mining titles prior to the issuance of patent is rarely attainable, and every possible step should be taken to insure reasonable certainty. Where in connection with the performance of labor or the preparation of documents there are two courses open to the claimant, one of which has been shown by precedent to be reasonably safe, and the other is doubtful, the safer course should be followed always. The path of the pioneer is often fraught with difficulties.

Other Vital Points

Fifth—The honesty, integrity and efficiency of all persons connected with the making of the locations under consideration, and the placing of improvements thereon, should be established. Locations, alleged to have been made by a person or persons who on one day will swear under oath to a statement of facts to influence a prospective purchaser and who on the next day will repudiate the statements so made to an agent of the government, will probably never be patented.

A most important step in connection with an application for patent to a mining claim is an examination of the title to the claim. This is a much more complicated and painstaking task than the ordinary examination of title to real estate.

The abstract is merely an outline or memorandum. It may show a clear chain of title and may be based on records senior to other records on the claim and still the title may be absolutely worthless. The documents should in each instance be examined, preferably by the original but if the originals are not available, then by the record.

It is indispensable to security to know what has been done upon the ground. We must know the time, place, and manner of making discovery, and whether the land embraced in a claim is chiefly valuable for oil shale. We must know whether the location notice was duly posted and what it contained; whether the stakes were properly set; whether there are upon the ground any notices or improvements which would indicate the presence of hostile claims, and if hostile claims are found, their seniority or juniority should be established.

We find in the oil shale regions that the surveys of many of the townships are of little value. The paper records may show an official and completed survey, but an examination of the ground may indicate nothing of the sort. Inasmuch as the law requires placer locations to conform with legal subdivisions where there are approved official surveys, it is necessary to know whether or not the claims, as staked upon the ground, conform with the legal subdivisions of the approved survey. If they do not and it is impossible to determine where such subdivisions should be, we must realize the facts that the stakes upon the ground shall govern, and that it is impossible, in view of the Leasing Act, to amend a location by including in it lands which were not included within the stakes as originally set, or, at least, as they were on the day that said act became effective. In a case such as this, it would probably be advisable to request a mineral survey by a Deputy U. S. Mineral Surveyor, in the same manner as though the lands were unsurveyed.

Study of Land Office Records

An examination of the records in the United States Land Office for the district in which the lands under consideration are situated, is necessary. We must know whether or not there are conflicting agricultural entries, and if so what their status is. The law does not permit the filing of an application for patent to mining claims in the United States Land Office when the lands have already been entered under agricultural entries. The agricultural entries must be withdrawn or cancelled before the mineral application can be filed.

In order to determine whether or not the claims were valid in their inception, it is necessary to know that each locator—

(A) Was at the time of the location a citizen of the United States, over the age of 21 years;

(B) Was a bona fide locator in his own interest, and in the interest of no one else whomsoever;

(C) Advanced his proportion of all expenses in connection with the making of the locations, either in money or labor; said proportion being equal to that of each of the other locators;

(D) If the interests of the locators have been disposed of, that he received his full share of the proceeds.

If the claims have been conveyed to a corporation, it is necessary to know that the conveyance was legal and not fraudulent as against the government, and that the corporation was lawfully entitled to receive a conveyance of the property; i. e., that the corporation is not attempting, by unlawful conspiracy, to secure a larger area of land under a placer location indirectly than it would be entitled to appropriate in a single location in its own name.

Work By Engineers

Preliminary to the actual work of the preparation of the documents in connection with the application for patent, there is much to be done by expert mining engineers. The patent labor must be examined and valued with an exactness such as would be exercised by agents of the government in their examinations. The mineral character of the land must be established and descriptions showing this fact must be prepared by an expert mining engineer or geologist. The topography of the property must be studied to enable the engineers to offer proof to the effect that the property is chiefly valuable for oil shale, and is not suitable for agricultural purposes, and further that the claimant does not seek to acquire the property to secure valuable timber or control water courses. Proof must also be submitted by competent persons to the effect that no vein or lode of quartz or other rock in place bearing gold, silver, cinnabar, lead, tin, or copper, or any other valuable deposit in place is known to exist within the limits of the claims applied for on the date that the application for patent is filed.

All documents in connection with the application for patent should be prepared in such manner that they state clearly all necessary facts in connection with the property, so that there will be no confusion in the minds of the Examining Board in the General Land Office when the documents reach Washington. Some additional effort in the preparation of these documents often saves much time and the preparation of additional instruments later on in the proceeding.

Established Precedents

Precedents have now been established in the work of perfecting titles to oil shale placer mining claims. Until the issuance of a patent for the Reed-Doyle group of claims, persons interested in oil shales were working more or less "in the dark." Since the issuance of the Reed-Doyle patent the government has issued patents to Roderick D. Burnham, D. D. Potter, R. P. Ralston, who were owners of a portion of the claims held under contract by Union Oil Company of California, Rea Eaton and others. Consequently, if the placer claims have been initiated in substantial compliance with the law and in good faith, no insurmountable obstacles should be encountered in the effort to secure patents from the government for the land.

OIL SHALE NOTES

Annual reports from three Scottish oil shale companies, subsidiaries of the Scottish Oils, Ltd., give the following: Broxurn, 7½ percent dividend declared; written off for depreciation, $84,000; cash balance, $63,290. Oakbank, 10 percent dividend declared; written off for depreciation, $100,000; cash balance, $151,860. Pumpherston, 10 percent dividend declared; written off for depreciation, $100,000; cash balance, $301,230.

For the month ending June 16, 1922, the Commonwealth Oil Corporation of New South Wales mined 1,973 tons of shale and retorted 2,023 tons. Two hundred thousand gallons of crude oil were produced, or approximately a hundred gallons to the ton.

The Index Shale Oil Co., of Debeque, Colo., has received forty sacks of oil shale from the English Oil Fields, Ltd., of Norfolk County, England, for treatment in the Brown retort.

A CURRENT BIBLIOGRAPHY FOR OIL SHALE

Bishop, J. A.
The Molecular Architecture of the Hydrocarbons. Mountain States Mineral Age, June, 1922, pp. 23-26.

Gavin, M. J.
Analytical Distillation of Oil Shale, E. and M. Journal, April 22, 1922, pp. 683-4.

Ginet, J. H.
Shale Men Answer Mr. Bain, Mountain States Mineral Age, June, 1922, pp. 14, 20-21.

Litinsky, L.
Die Anfange der Oelschieferverwertung in Russland, Petroleum, Berlin, April 10, 1921, pp. 368-371.

Mackenzie, J. C. D.
The Turner Internally-Heated Retort, Petroleum Times, London, July 1, 1922, pp. 14-15.

Narbutt, J.
Isolation of Organic Substance of Esthonian Shale (German), Z. Angew Chem, 1922, 35, 238-9.
Oil Shale Facts of Value Are Developed by Sworn Testimony of Authorities—Am. Min. Con. Journal, July, 1922, pp. 305-6.

Winchester, Dean E.
Factors Influencing the Value of Oil Shale Lands, E. and M. Journal-Press, July 8, 1922, pp. 61-66.

VALUABLE TRADE DATA IN U. S. HANDBOOK

THE TARIFF COMMISSION has issued, under the title "Handbook of Commercial Treaties," an exceedingly useful contribution to the study of commercial treaties and tariff agreements. This volume is not merely a collection of treaty texts, but is a comprehensive analysis of the stipulations contained in the commercial treaties of all nations.

The bulk of the work consists of synopses or digests so classified as to exhibit the contents of any particular treaty in the most effective manner. For example, all stipulations in treaties granting "most-favored-nation treatment" or "national treatment" (or both, as the case may be) are brought together under those respective heads, so as to show at a glance the various subjects in regard to which such treatment is pledged by any given country to any other, and to what others. Similarly, the various subjects expressly excepted from a given treaty, and whether or not and how far the treaty applies to colonial possessions, are conspicuously shown under the appropriate heads.

Besides the digests of treaties, the volume contains chapters setting out the established principles of international law regarding negotiation and operation of treaties, and comprehensive chronological lists of treaties in force between all nations. An appendix brings the work down to March, 1922.

AUTHORITY DISCUSSES U. S. WAGES

THE HIGH COST of labor in the United States has comparatively little effect on the ability of Americans to compete with foreign producers in foreign markets, according to Director Klein of the Bureau of Foreign and Domestic Commerce, who illustrates his point by citing the international coal situation.

While wages paid American miners are higher than those paid British miners, under normal conditions American coal can be placed f. o. b. Norfolk at a lower cost than in a comparable position at Cardiff. This, Dr. Klein says, is mainly because of the greater productive capacity of American miners.

INVESTING IN MINING PROSPECTS

Hard Common Sense and Good Business Judgment are Well Capable to Cope With Hazard of Uncertainty—Lack of Sufficient Capital is Prime Cause of Losses Close Scrutiny of Details Is Main Safety

By KIRBY THOMAS, *Mining Engineer*

THE risks of investing in any business enterprise at its inception, or in its first stages, are greater than they are in the later stages, when the undertaking is established and perhaps earning a profit. This is true with mining propositions to a greater degree than with most other commercial or industrial undertakings. There are, too, certain features in connection with all mining investments increasing this risk often not duly considered by the prospective investor, who, at the time of investing, is likely to be more or less under the spell of the mining vendor or the stock salesman and self-blinded by the promise of very large gain in the transaction.

Prospect's Value Difficult to Place

It is but seldom that mineral deposits are found, which can be determined to be of sufficient commercial value to justify a mining operation without much expensive labor. A mineral deposit, the extent and value of which is unproven, is termed a "prospect"—an obvious name. The value of a prospect is difficult to measure, and its profit possibilities, if any, are latent. It is in this prospect stage that much money is lost in mining, not only by investors, but by skilled and experienced miners and engineers.

A prospect mining proposition is essentially and inherently hazardous. The mining engineer and the mining men will not deny this; in fact, they recognize it by offering to the investor a large interest at a low figure, or by associating with others in the cost of the development to divide the risk. This great risk is evidenced also in the low price of the shares in prospecting and developing companies. There is a chance either of a failure and total loss, or of a success, which may mean a many-fold gain for all.

If the investor goes into a prospect mining proposition with his eyes open to the risks, which risks he takes for the chance of the great gain expected, no blame should be attached to anyone if a loss ensues. However, because of the great physical risks in a mining prospect great business precautions should be taken.

The first consideration is the title. It hardly seems necessary to mention such an elementary matter, but the fact is that mining stock investors often have no knowledge and make no inquiry as to the title under which the company holds the property. Mining property in the western United States and in Mexico may be held under "location" or "denouncement"—that is, the title is in process. Frequently, companies offer stock when the title to their properties is in this stage.

Ordinarily, this is reasonably safe, but there is a chance of the full title failing to issue on a technicality or irregularity. Therefore, it is best for the investor to insist upon the protection of full face title to the property, or upon a guarantee, or to hold a string on his money until title is perfected—ordinarily a matter of a few months. Many stocks are sold by companies which hold their properties under a form of contract, customary in the mining business, known as a "lease or bond." The owner gives to the company, or to the promoter, a lease with the right to develop and operate the property for a given period, usually one or two years, and an option to purchase for a stipulated price and terms during the period of the lease. The idea of this negotiation is self-evident.

The purchaser of the property has opportunity to prove to his satisfaction that the property is worth the price. Ordinarily it is stipulated that development and exploration shall be done. This form of contract is sound and is usually resorted to by experienced men in negotiations for undeveloped and unproven properties. On the other hand, the mining investor is often unfamiliar with the business risks involved in a lease and bond proposition.

A Frequent Situation

The investor often does not know that the property, encouraging reports of which may be before him, does not belong to the company offering him its stock, and this fact is sometimes not impressed upon him duly. He does not know that should the expensive work necessary, part of which he is to pay for, prove the property to be of no value, the company must then pay many thousands or a million or more for the property; and he does not consider that if the property should be proven to be very valuable, his associates in the transaction may not be financially able to complete the deal, or the conditions of the negotiations may be such that the money to purchase the property cannot be raised. The investor who goes into a company, owning only a contract, or a lease, on a mine, should recognize that, aside from taking the usual physical risks of mining, he is taking also very great business risks in respect to the ability of his company, or its backers, to carry out the terms of the contract and acquire the property for the company.

In the purchase of a stock interest in a property, held under lease and bond, it should, however, be borne in mind that if the company can raise enough money to prove up the property, and to give it a measurable value greater than the contract price, then the transaction is reasonably safe within itself, for, even though the first investors may not be able to raise the purchase price, there is always a market for developed and proven mining properties.

The Usual Procedure

Usually in a prospect mining proposition the owner takes a part of the stock of the company in exchange for his property, the remaining stock going mostly into the treasury of the company, to be sold to develop the property, and thus make all the stock valuable. The prospective investor should inquire as to the proportion of the issued stock which the owner receives, and also what part certain intermediaries, called promoters or stock agents, acquire as their profit. There is no set rule or guide as to how much stock should be issued for the property, but the amount and all conditions should be always critically considered.

Other primary points in a prospect mining deal relate to the capitalization of the company, and the amount of the stock in the treasury. If one is purchasing mining stock, which is not from the treasury of the company, he is simply making a trade. If he purchases stock from the company's treasury, his money goes to his company, and is, or should be, used in making his property more valuable; consequently, other things being equal, it is more advantageous to buy treasury stock than individual stocks, a matter often overlooked. The number of shares in the treasury is vitally important, for, if there is but little treasury stock, the company may have difficulty in raising the money needed for the development and purchase of the property, and to borrow on company

notes or bonds is ordinarily, for evident business reasons, not practicable in the case of prospect companies.

Extravagant impositions in the form and guise of commissions to the stock salesmen, brokers and intermediaries for raising the funds, often accompany mining fictations; so this point should be scrutinized always. Often the investor considers the stock on its own merits, without inquiring as to what part of the dollar which he pays goes into his property. In some notorious cases the cost of raising money for mining enterprises has been from 50 to 90 percent of the money raised—a condition obviously and glaringly wrong from a business standpoint, and a forerunner of failure of the enterprise saddled with such incompetency or dishonesty.

The Customary Method

In financing a prospect mining company, it is customary to pool the owner's and the promoter's stock. The stock investor should usually insist on such an arrangement and should know of the details of the pool agreement. If the owner and the promoter cannot sell any of their stock until the mine is profitable, they are likely to have a lively and continued interest in the success of the undertaking, and such a plan makes them carry the full risk along with the man who furnishes the money. The pooled stock, too, is taken off the market and thus the financing is easier and surer.

The mining stock investor is often influenced by the eminent respectability and high standing of the board of directors, but he should bear in mind that sometimes bankers, lawyers and others lend their names to mining corporations without first having thorough knowledge of the undertaking and that they sometimes do not give the attention to the business which is, morally, at least, incumbent upon company officers. Not infrequently fine-feathered directors have been given their stock free for the use of their names.

Should be Accompanied by Report

A mining stock offering should always be accompanied by a report from a distinterested mining engineer or other competent person. Statements by the owner or the agents should be designated as "vendors' reports," as is the British practice. Mining reports are not infallible, either, as to competency or integrity. The reputation and experience of the man making the report is always a wise and proper subject for inquiry. Most reports on prospects are opinions and should be taken as such. The prospective stock buyer should study the reports and weigh the facts and conclusions in all their bearings himself, for manipulation of reports of over-zealous vendors is one of the tricks of the business. If the technical parts of the report are beyond the knowledge or experience of the investor, he should consult a friend with mining experience, or, better, he should seek directly the advice of a mining engineer in good standing as he would consult a lawyer in any other business transaction.

Evident Guidance Furnished

There are outward evidences which generally indicate to a wise and wary investor the unsound companies: Promises of immediate dividends from a prospect, extravagant claims and incomplete or misleading statements about the property, announcement of arbitrary stock advances, suggestions of philanthropy in the promotion, failure to present essential points, evidence of lax business methods or of financial incompetence, claims of the discovery of wonder-working ore processes, positive valuations of the undeveloped, and hence unknown, ore-bodies, these and other equally axiomatic indications of incompetency or dishonesty should automatically protect the public—but unfortunately they do not.

The purchase of stock in a mining prospect company is not an investment in the sense that the transaction may be expected to result in early regular dividends, but it may be, nevertheless, a good speculative business proposition and profitable. There is the chance for profits during the development period from the enhanced price of the stock as the prospect development progresses, and, of course, always the expectation that sooner or later the prospect will be a mine and then the stock will have an intrinsic value greater many times than the price paid. Sometimes, and often, men buy mining stocks solely on the chance that the price on the curb market will rise or be raised, and that they can unload at a profit. This is a speculation, and in the same class as any speculation in other stocks or with the markets.

The chief, and to be expected, cause of loss in investments in mining prospects is the failure to find valuable ore in commercial quantities in the property. Not one in a hundred prospects makes a mine. Generally, the limited work of the prospector or the owner determines this, and the discoveries die aborning. Other prospects, with a little work, hold out much hope and encouragement. The prospector comes to have faith in them, the mining man thinks that they will make good, and the engineer makes a favorable report on them as prospects. At this stage the proposition is likely to be offered to the investor, as usually much more money is needed than the owner has or can afford to risk.

Provisions of sufficient funds for the company at this stage will not, however, ensure success. The business must have honest and competent management, and probably also technical engineering guidance. The company must be financially able to carry out the necessary explorations and developments. These success factors being all favorable, there is then reason to expect a profitable investment, barring, of course, the inherent physical risk of there not being enough valuable ore in the property to make a paying mine.

It should hardly be necessary to caution a business man as to the wisdom and necessity of skilled, competent management of any business. Yet it is true that many mining companies, particularly those engaged in making mines from prospects, are woefully mismanaged, chiefly for the reason that many people do not recognize that mining in nearly all its phases is an intricate, specialized form of business activity, requiring special experience and technical training as well as a high order of business ability.

Lack of Capital Causes Failures

Most prospects take much more money to prove than the sanguine owner or promoter expects, or the stock buyer is led to expect. Lack of sufficient capital is the cause of many failures, for rarely can enough ore be taken from a prospect to pay for its development.

All of the rich mines now operating were once prospects, in most cases not many years ago, and each year many prospects are developed into mines making great riches for many individuals and wealth for the community. Those who are prepared to take the money risk involved, and who will use hard common sense and good business judgment, and who will study the game, will find as much interest and profit in investing in mining prospects as they will in most other business activities—especially if they are persistent.

UNDERGROUND TRANSPORTATION SECTION TO MEET

A MEETING of the Underground Transportation Section of the Standardization Division of the American Mining Congress will be held on September 6 at 10 a. m. at the office of Charles M. Means, consulting engineer, Oliver Building, Pittsburgh, Pa.

C. E. Watt, of the Berwind-White Coal Company, is chairman of this committee, and the meeting is called for the purpose of coordinating the various reports of the sub-committees of the Underground Transportation Section of the Division.

MANY COMPLEX FACTORS IN COAL STORAGE

Major Points Developed By Close Study Are Outlined By O. P. Hood, Chief Mechanical Engineer of Bureau of Mines—Question of Holding Coal in Large Quantities Is Vital Factor in Stabilization Efforts

FACTORS THAT demonstrably are most concerned in the storage of coal in large quantities are outlined in a technical paper prepared by O. P. Hood, chief mechanical engineer of the Bureau of Mines, and issued by that agency. With development of practical storage of coal to eliminate the seasonable character of the industry standing as one of the main means by which better conditions in the business of mining coal will be invited, Mr. Hood's conclusions are especially appropriate at the present time.

"Everyone desires to have directions for storage that are perfectly simple and yet will insure against loss," says Mr. Hood. "Unfortunately, the problem is too complicated for a simple solution. Many of the factors involved are difficult to determine, as there are no practical means of quantitative measurement. The factors involve chemistry, physics, and engineering, and the man who is in close contact with the problem of stored coal is not always a good observer in these several lines. The result is many incorrect theories, opinions, and prejudices. Much has been written on the subject, and the Bureau of Mines has published the results of extensive investigations, but the diversity of widely held opinions show that there is need of pointing out what are the factors that are most concerned in the spontaneous heating of coal."

These factors have been well developed by the Bureau of Mines during the course of intensive studies which it has been devoting to the subject. Results of these studies soon will be supplemented by information gathered by the coal division of the Bureau of Foreign and Domestic Commerce.

Acre of Surface in Ton of Coal

The heating of coal is believed to be a surface phenomenon. If a ton of bituminous coal could be delivered in a single cube, each dimension of the cube would be about 2.8 feet. When coal heats, it is due to something that goes on with respect to the surface and not something that happens inside of the piece. So far as is known, this is true no matter how finely the piece is divided. It is, therefore, interesting to know the area of the total exposed surface in a ton of coal. If the cube, having originally an area of about 47 square feet, be continuously subdivided until all the pieces are fine enough just to pass through a 16-mesh screen the area of exposed surface in one ton of coal becomes an acre. It is perfectly obvious from this why it is that trouble from spontaneous combustion originates in fine coal, because the great increase in extent of surface does not begin until one gets below 1¼ inch, or nut size. If fine coal is kept out of the pile the heating surface is relatively so small as to remove the cause of spontaneous combustion. This remark applies not to the fact that one may buy lump coal but to the size of what actually gets into the storage pile. Coal bought as lump at the mine and handled with modern disregard for breakage may be far from lump coal when in the pile.

GOVERNMENT COAL IN STORAGE

Profiting by experience gained from its extensive studies of the coal storage problem, the Bureau of Mines has been proving the value of its practices in handling the business of the Government Fuel Yard in Washington, D. C., where the above photograph was taken

Finds Certain Amount of Heat

A unit of area of this coal surface generates a certain amount of heat, provided the coal can find the combining material, that is, oxygen. The amount of heat generated depends upon the temperature of a piece of coal. That is to say, coal put into storage at a temperature of 80° F. will generate very much more heat per unit of surface than if put into storage at the temperature of 60° F. It has already been a matter of observation that coal stored during the hot months of summer and in heated regions is much more liable to spontaneous combustion than coal stored in colder climes and in cooler seasons of the year.

Another most important factor is the freshness of the broken coal surface. For the first few days or weeks the freshly broken coal surface is very much more active in the taking up of oxygen and consequent production of heat than after a few weeks or months—a fact that must be borne in mind when considering the wisdom of crushing coal immediately before storing it. Spontaneous fires rarely occur after the coal surfaces have been exposed for three months. As the rate of heating increases with the temperature, it is evident that if the heat generated is not removed, the process becomes a self-aggravating one, and the rate of heat generation, instead of falling, may rise with time. If the temperature of the pile reaches 140° or 150° F. and continues to rise, there is a high probability that within a few weeks a destructive temperature will be reached. If the temperature reaches 160° or 180° F. there is almost a certainty that a destructive temperature will be reached and that the coal must be moved. Immediately the question of getting rid of the heat is presented.

A Pile of Coal "Breathes"

A coal pile is cooled by radiation and by the movement of air through it. Air moves rather freely through a pile of coal, and in many piles of coal this natural change, or breathing, of air is enough to carry away the heat generated. Some observers have stated that, in general, fires in large coal piles are found in the region from 5 to 8 feet below the surface on the flanks of the pile. The rise in temperature of a coal pile is thus intimately connected with a very complicated ventilating problem, and there are no means of observing or measuring these small and wayward ventilating currents.

There are many more factors of minor importance, continues Mr. Hood. One of the troubles has been that undue attention has often been given to the minor factors, such as the sulphur or the volatile-matter content of the coal, height of pile, etc., while the main factors, such as initial temperature, breakage in handling, freshness of the coal, and the screening before storage, have been overlooked or minimized.

NATIONAL LEGISLATION

By E. H. PULLMAN

ENACTMENT of the revised tariff bill is in early prospect. On August 19, after four months' continuous debate, the Senate passed the measure and it is now being considered by conference committees of the House and Senate composed of the ranking members of the committees which drafted and revised the bill, the House Committee on Ways and Means and the Senate on Finance.

The tariff bill has had a long and hard struggle. It was passed by the House of Representatives July 21, 1921, and has been the subject of committee and Senate consideration since that time. The bill was continuously before the Senate from April 10, 1922, when it was received on report from the Finance Committee with amendments to the House next. The Senate accepted the Finance Committee recommendation to assess duties on the basis of the foreign value of imported merchandise as against the American valuation plan as proposed by the House. The only exception to this plan was made in the case of chemicals and dyes, on which products the President is authorized to assess duties on the basis of the American valuation plan after he has exhausted his authority under the flexible tariff provisions to increase duties on chemicals and dyes by 50% of the rate of duties provided in the bill. On all other products the President, under the flexible tariff provisions, is authorized to lower or raise, by not more than 50% of the duties fixed in the bill, the tariff on imported merchandise to equalize the difference in the cost of production between this and foreign countries.

Ore Freight Rates Discussed

Effort was made to take into consideration the matter of freight rates on western products in adjusting duties under this clause. This action was urged by western senators, who insisted that shippers of ores and other products paid the freight. It was announced that manganese would be among the first articles to be called to the attention of the President after passage of the bill in an attempt to increase the duties on that product so as to include consideration of the cost of transportation of the product from western mines to consuming points in the East. The provisions of the flexible tariff will continue until July 1, 1924.

Potash was placed on the free list, the Senate rejecting proposals for five-year duties thereon and also for a bounty on domestic production.

White arsenic was also placed on the free list.

Although democratic senators criticized almost every schedule of the tariff bill, the metal schedule was spared. Senator Simmons, Dem., of North Carolina, instead of criticizing it, praised it, saying: "There is not a schedule in this bill upon which the rates imposed are more justified than those in the metal schedule."

Charges that senators were financially interested in the tariff were countered by the declaration of Senator Gooding, Rep., Idaho, that newspapers opposing the tariff were actuated by financial motives in securing advertising from importers. Senator Gooding charged that one New York publisher, Frank A. Munsey, has interests in foreign mines, glass and pottery plants.

The effort to place a duty of 20% ad valorem on crude asbestos in behalf of western miners failed.

An effort to prevent senators who might be interested in articles affected by the tariff from voting thereon failed. In support of the claim that senators whose private business might be affected by the tariff should not vote, it was stated that a senator during consideration of the tariff law in 1909 withheld his vote on the lead and zinc schedule because of his interest in Wisconsin mines.

Coal Bills Lag

Although the President is looking into the coal industry with a view of bringing new recommendations in the hope of preventing further industrial strikes, no action or even debate thereon has been had in the Senate. Senators have considered it the most logical course to refrain from discussion or action on the matter while the President is attempting to end the strikes by mediation.

Senator Borah, Rep., Idaho, suggests that investigation of the coal industry be made by a coal commission of three members, one each representing the operators, miners and the public. The purpose of the investigation would be to assist Congress relative to legislation either in the nationalization or the control of the coal industry. Senator King, Dem., Utah, introduced a resolution authorizing the President to appoint a commission to settle the coal strike and to consider other questions involved.

Industrial Court Proposed

Senator Spencer, Rep., Missouri, introduced a bill for the settlement of industrial disputes by a Federal Court of Conciliation, consisting of three judges, having the qualifications and powers of District Judges, the decisions of this court to be enforced the same as those of other Federal Courts. Appeals could be taken to the Circuit Court of Appeals and certified by these courts to the Supreme Court. The orders of the Conciliation Court would remain in effect pending the decisions of the higher courts. The bill stipulates, however, that no order of the court shall require any individual man to work except when and where and under such conditions as he pleases.

Senator Jones, Rep., Washington, introduced a bill for the organization and establishment of stock corporations of five or more citizens to engage in foreign trade and commerce, two-thirds of whom shall be citizens of the United States and one-third residents of the United States. Provision is made for incorporation of these companies under the Department of Commerce.

Both houses passed the bill authorizing 50-year leases of surplus power developed by the Salt River reclamation project in Arizona in which mining companies are interested.

IMPORTANT BILLS REVIEWED IN THIS ISSUE

COAL—

S. 3865: (By Mr. Borah, R., Ida.) Investigation.

S. J. Res. 230: (By Mr. King, D., Utah.) Mine wages.

INDUSTRY—

S. 3889: (By Mr. Spencer, R., Mo.) Conciliation Court.

CHILD LABOR:

S. J. Res. 232: (By Mr. McCormick, R., Ill.)

CORPORATIONS—

S. 3888: (By Mr. Jones, R., Wash.) Foreign Trade.

TRANSPORTATION:

S. 1345: (By Mr. Spencer, R., Mo.) Claims.

CLAIMS—

S. 3852: (By Mr. Underwood, D., Ala.) War.

While the matter of the disposition of the Muscle Shoals nitrate project is before the Senate and the House action may be deferred until the next regular session beginning in December.

Silver Resolution Presented

The resolution adopted at the Western Conference of the American Mining Congress at Denver in June on the international stabilization of silver was presented to the Senate by Senator King, Dem., of Utah, and, at his request, referred for consideration to the Committee on Banking and Currency. This action was unusual, as the general rule requires the introduction by a Senator of a resolution for its reference to a committee. In this instance an unusual compliment was paid to the American Mining Congress by having one of its convention resolutions referred direct to a Senate Committee for consideration without a senator introducing the same as a result of his own production. In presenting the resolution, Senator King stated that it is couched in temperate language, is admirably phrased and contains a sound recommendation. He asked the Banking Committee to investigate the matter and make recommendation tending to secure the international stabilization of silver.

In a report to the Senate, Attorney General Daugherty states that a proposed merger of various steel companies will not violate any of the present anti-trust laws.

House Awaits Tariff

The House of Representatives reconvened on August 15 after its recess which began July 3. The principal work of the House is expected to be confined to the completion of the enactment of the revised tariff bill, which involves the consideration of the measure by a conference committee of the House and Senate and final action by the House on the report of this committee. House leaders do not believe it advisable to consider the ship subsidy bill at this session because the Senate calendar is crowded with unfinished business and that body could not consider the measure at this session. The House will probably content itself with considering legislation to meet the industrial situation growing out of the strikes which may be recommended by the President, together with miscellaneous business which may develop. Congressional leaders hope that the legislative situation will so shape itself as to permit adjournment by October 15.

COAL

Investigation

S. 3865. Introduced by Mr. Borah, Rep., Idaho. Referred to the Committee on Labor. This bill proposes the establishment of a United States Coal Commission, whose life would be limited to one year, unless otherwise provided by Congress, to consist of three members appointed by the President and confirmed by the Senate. No member shall be selected from the House of Representatives or the Senate. One of the members would be selected from three nominees suggested by the National Coal Association, one from three nominees recommended by the United Mine Workers' Association and one representing the public, who shall not be interested in a business way with the coal industry. The Commissioners' salaries are fixed at $8,000 per year.

In presenting the measure, Senator Borah said that the purpose was not to meet the present coal emergency, but to provide for future contingencies. In view of the general interest manifested in the measure, its provisions regarding investigation of the coal industry are given herewith fully.

It shall be the duty of the commission to investigate fully the conditions, ascertain the facts and study the questions relating to the coal industry with a view of aiding, assisting, and advising Congress relative to legislation either in the nationalization or the regulation and control of the coal industry by the Government.

To this end the said commission shall ascertain and report to Congress and the President, first, as to the ownership and title of the mines; second, cost of production; third, profits realized by the operators or owners of mines during the last ten years, labor costs, wages paid, irregular production and suggestions as to remedy for the same and all facts, circumstances, or conditions which would be deemed essential in determining and establishing a wise policy relative to the industry by the Government.

The commission shall also submit recommendations relative to:

a. Standardizing the mines upon the basis of their productive capacity, and regarding the closing down of mines which by reason of their natural limitations fall below the standard.

b. Standardizing the cost of living for mine workers and the living conditions which must be supplied or afforded in order to surround the workmen with reasonable comforts, recognizing the psychological effect of such surroundings in respect to their efficiency.

c. Standardizing a basis of arriving at the overhead cost of producing the coal and delivering it at the door of the consumer, recognizing in this compilation that the standardized cost of living to the miners must be the first and irreducible item of expense.

d. The advisability or necessity of nationalizing the coal industry.

e. The feasibility or necessity of governmental regulation and control of the coal industry.

The first report and recommendations of the Commission are to be submitted not later than nine months after approval of the act. Authority is given the commission to subpoena persons and books from any place in the country at any place of hearing the commission may conduct.

No person shall be excused from at-

tending, testifying and deposing or from producing any book, paper, document, or other evidence, on the ground that the testimony or evidence, documentary or otherwise, may tend to incriminate him or subject him to a penalty or forfeiture; but no natural person shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter, or thing as to which, in obedience to a subpoena and under oath, he may testify or produce in evidence; except that no person shall be exempt from prosecution and punishment for perjury committed in so testifying.

Every officer or employee of the United States whenever requested by the commission shall supply it with any data or information pertaining to any investigation by the commission which may be contained in the records of the office of such officer or employee.

No person shall wilfully fail or refuse to make any report required by the commission, or make in any such report any statement which is false in any material particular. Any person who violates this subdivision shall, upon conviction, be fined not more than $5,000, or imprisoned for not more than one year, or both.

An appropriation of $100,000 is made for expenses of the commission and the salary of any of its employees shall not exceed $5,000.

Mine Wages

S. J. Res. 230. Introduced by Mr. King, Dem., Utah. Committee reference not requested. This resolution authorizes the President to appoint a commission to investigate the issues involved in the coal strike. The commission would consist of five members, the selection of which is left entirely to the President without detailed instruction as to how they may be named. It is proposed that the commission shall investigate the existing controversy between miners and mine operators in the coal-mining industry as to proper wages to be paid for the work of mining coal and any other cognate questions which are involved.

The commission shall summon to appear before it accredited representatives of both the coal miners and the mine operators, receive their statements as to the matters and points in controversy, examine the merits of the contentions made by the respective parties and investigate and determine any questions of fact which are material or necessary to a determination of the controversy. The commission shall make findings as to the material and controlling facts in controversy and recommendations as to the wages it considers proper and equitable to be paid for the work of mining coal in the different fields or regions of coal production in the United States, and for the settlement of any other cognate question in controversy, and shall report such findings and recommendations to the President, who, if he approve the same, shall issue his proclamation accordingly and make official publication of such findings and recommendations.

INDUSTRY

Conciliation Court

S. 3889. Introduced by Mr. Spencer, Rep., Missouri, referred to the Committee on Judiciary. This bill proposes the establishment of a Federal Court of Conciliation, whose judges shall possess the same qualifications and authority as judges of U. S. district courts. The court shall sit at such places in the United States as determined by it or as requested by the President. The bill confers jurisdiction on the court to hear and determine controversies or disputes affecting the operations of interstate commerce and to enforce its decisions the same as federal courts. The bill gives the court jurisdiction by petition or otherwise to hear and determine controversies or disputes between employers and employees in connection with the transportation of commodities in interstate commerce or in connection with any industry whose product directly and immediately is essential to such transportation, the settlement of which has failed by conference, conciliation, voluntary arbitration or otherwise and the dispute endangers the general welfare. The court would issue such orders or decrees as the evidence may require and protect the interests of the parties thereto, and secure the continuity and efficiency of interstate commerce. Either party to the dispute may, after complying with the court's orders for thirty days, apply to the court for modification or reversal of the order. Appeals may be taken by either party from orders of the court to the Circuit Court of Appeals of the Circuit where the order is issued. The decision of the Circuit Court of Appeals shall be final unless it authorizes an appeal to the United States Supreme Court. Pending determination of appeals, however, the orders of the Court of Conciliation would remain in effect.

The bill stipulates "that no order, judgment or decree shall require any individual man to work except when and where and under such conditions as he pleases."

CHILD LABOR

S. J. Res. 232. Introduced by Mr. McCormick, Rep., Illinois. This measure proposes an amendment to the Constitution giving Congress the power to limit or prohibit the labor of persons under eighteen years of age. Power is reserved to the several States to limit or prohibit such labor in any way which does not lessen any limitation of such labor or the extent of any prohibition thereof by Congress. The power vested in Congress by this article shall be additional to and not a limitation on the powers elsewhere vested in Congress by the Constitution with respect to such labor.

CORPORATIONS

Foreign Trade

S. 3888. Introduced by Mr. Jones, Rep., Washington, referred to the Committee on Commerce.

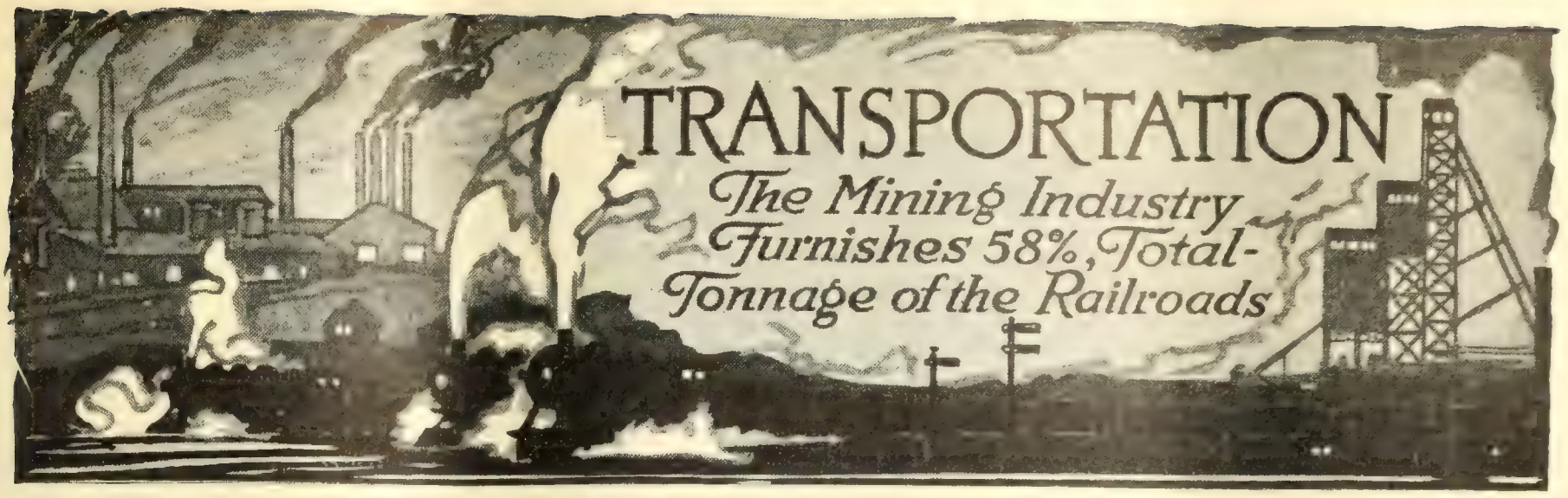
This bill provides for the organization and establishment of stock corporations to engage in foreign trade or commerce. It authorizes five or more persons, two-thirds of whom shall be American citizens and one-third residents of the United States, to form stock corporations for the purpose of engaging in foreign trade or commerce between places within and places wholly outside the territorial limits of the several States and of the insular possessions of the United States. The corporations would be under the Department of Commerce and they would be authorized to attach to their name the designation "Federal Inc., U. S. A."

TRANSPORTATION

Claims

S. 1345. Amendment thereto introduced by Mr. Spencer, Rep., Missouri, bill being on the Senate calendar subject to consideration. The amendment provides that any railroad company or employee who shall intentionally omit, conceal, falsify, or misrepresent any record of the railroad with intent to prevent, delay or reduce any claim against the railroad for loss or damage to any shipment on the railroad shall be guilty of a misdemeanor, and, on conviction, be punished by a fine of not exceeding $10,000 if the conviction is of the railroad company, and not more than $2,000 or imprisonment in the penitentiary not to exceed two years, or both, if the conviction is of an employee of the railroad.

S. J. Res. 225. Introduced by Mr. King, Dem., Utah. Referred to the Committee on Judiciary. This resolution is similar to that previously introduced by Representative Winslow, Rep., Massachusetts for settlement of claims not exceeding $10,000 in volved in the administration of the Alien Property Custodian.



SEVERE CAR SHORTAGES AND TRAFFIC CONGESTIONS EXPECTED TO COME IN WAKE OF STRIKES

WELL-INFORMED railroad men and shippers expect one of the most severe car shortages and traffic congestions the country has ever known immediately after the conclusion of the railroad and coal strikes. Traffic now, in everything except coal, is heavier than it was in 1920, the year of heaviest tonnage the railroads ever moved. That year was heavier than either of the war years. The promise is that this one, from the date of the settlement of the strikes will be even more exasperating from the point of view of the bedevilled railroad operators and the traffic managers of shippers.

More traffic, coal excepted, is being handled now than ever before. In the week ended August 12, the last week for which figures were available, the volume of traffic reached 852,580 cars, of which only 84,559 cars were coal. In commodities other than coal, the loading was nearly 20,000 greater than in the record year 1920. The normal coal-loading at this season of the year is about 187,000 cars per week, or about 103,000 cars more than the total of the week under discussion.

Coal Will Jam Roads

On account of the shortage of coal, resumption of work in all the mines will cause such a demand that it is generally believed it will be impossible for the railroads to meet it. The congestion and car shortage will prevail regardless of whether or not the traffic transported goes over the figures for 1920. The number of bad order cars is supposed to be greater than it was in 1920, and the engines, according to the allegations of the striking shopmen, denied by the railroad managers, are not in as good condition.

It is, of course, never possible to make accurate figures about bad order cars. When a railroad does not need equipment it counts cars as being in bad order, which, in times of brisk demand, are counted as being fit for service.

The Outstanding Facts

The outstanding fact is that there has not been any serious interference with traffic except in the districts in which coal mines have been in operation. That is easily explained. The striking shopmen have concentrated their destructive efforts on the railroads serving the mines that continued in operation. While the trainmen have not gone on strike, it is believed they have done everything possible to hamper the return of cars to the roads serving the mines in operation. The walkouts at Corbin, Ky., and other points on the railroad systems carrying the non-union coal were direct efforts to help the striking shopmen. The thousands of acts of sabotage at points not so much in the public eye have done much to slow up the movement of cars to and from the railroads that kept the country going by hauling the comparatively small amount of coal produced.

On account of the acute condition of the railroads in the strike centers, the Interstate Commerce Commission, during the month, cancelled the hearings on the assigned car rule that were to have been resumed August 14. It would have been a waste of time to have continued that hearing on days when the attention of the railroad men, who could have given the Commission information needed by it to dispose of the troublesome question, was needed elsewhere. The railroad men would not have voluntarily come to Washington to give testimony while their services were needed at their stations. The country would have protested had the Commission required their attendance, hence the determination temporarily to lay aside the plan for resuming the hearings.

Seek Use of Coal Cars

At the time this was written the Commission was giving a hearing to representatives of the Associated General Contractors. They asked for a modification of the Commission's Service Order No. 23. That is the one that confines the use of coal cars to the coal-carrying trade. The contractors suggested to the Commission that its order left, for the transportation of road-making and building materials only 33,000 cars per week; also that it would be poor policy to enforce that order so stringently as to bring about a shut down of the building trades. Their idea was that the order should be modified so as to release about double the number of cars, on the theory that the country could be served in its fuel requirements with a fewer number of cars if no effort were made now to build up stocks of fuel. In other words, that for current use it was not necessary to transport 10,000,000 tons of coal per week, because experience had shown that, while that was the average throughout the year, it covered more than the actual requirements.

Crops Are Factor

One reason for expecting the most severe congestion and shortage ever known is that the crops are enormous. Before the contractors appeared in behalf of a modification of Service Order No. 23, the movement of fruits had become so great that from every part of the country came a cry for more refrigerators. Even before the conference between the railroad executives and representatives of the strikers in New York August 23, it had become obvious to members of the Interstate Commerce Commission that a considerable part of the perishable crop of the country was

doomed to destruction because the railroads and private car lines had not enough refrigerator cars to haul it to market.

This inability of the railroads and the private car lines to provide cars enough to save the perishable crop resulted, in part, from the strike of the shopmen, but more from the high prices demanded for cars. While thousands of cars of all kinds have been ordered within the past year, the delivery of new equipment has been comparatively small. Strikes have hampered all lines of industry to such an extent that the farmers and orchardists are due to suffer heavy losses through the inability of the railroads to provide equipment. The prospect for an early ending of the strike by reason of the conference resumed in New York August 23 was no rainbow of hope for the fruit and vegetable growers. They needed cars then, and not in a month or six weeks. Immediate ending of the strike would not have helped them.

Coincident with the resumption of conferences between the railroad executives and representatives of the shopmen, the House committee on interstate and foreign commerce was taking up the proposition of President Harding, made in his address to Congress August 18, for the creation of a fact-finding commission to investigate the coal industry. At the same time, Attorney General Daugherty was trying to write a bill enabling Congress to provide a governmental coal-purchasing agency, the function of which would be to undertake the control of prices for coal, under pretense that such an agency would be part of the machinery erected for the regulation of commerce between the states, instead of merely a price-control machine.

Lack of Enthusiasm

There was no enthusiasm in Congress for the price control proposition. The inclination was to regard that proposal as evidence of obsession on the part of Secretary Hoover on the price question. A similar lack of enthusiasm was noted with respect to the President's suggestion that Congress put teeth into the Railroad Labor Board sections of the interstate commerce law. Leaders in Congress frankly said no effort would be made to take up that recommendation until after election. Congressional fear of that proposal was obvious. One of the arguments made against it was that if the shopmen would not respect decisions of the board now they certainly would not respect it if and when penalties might be added for disregard of its decisions, especially in view of the fact that acts of violence, penalties for which are heavier than any Congress might write into the Labor Board sections of the law, were being committed daily by the strikers. The suggestion, generally, was regarded as futile, unless it should be backed by such overwhelming public sentiment that there would really be no minority. Inasmuch as Samuel Gompers and other labor leaders had gone on record as being prepared to oppose any attemtps at legislation of that kind, probability of passage in such form as to amount to anything if the amendments could be enforced, was regarded as about as small as that Germany and France will ever agree as to the location of the true boundary line between them.

Gompers and other labor leaders time and again have declined in one way or another to answer whether they would or would not advise their followers to obey such a law if enacted. Those who have watched them narrowly since 1916 have no doubt but that, in the event legislation with teeth in it were enacted, they would advise their followers to ignore and flout it. Gompers, in 1916, to avoid being forced into an answer, excused himself from the committee room where Representative Webster of Spokane, Wash., had cornered him. When he came back he had framed up a jumble of words that did not mean anything, but which was taken by the Washington man as indicating that Gompers would advise his followers to violate a law of that kind.

MANY MINING CASES PENDING BEFORE SUPREME COURT

MANY LEGAL contests of vital interest to the mining industry are included in the list of cases pending before the United States Supreme Court, having failed to gain action before the court recessed until next October. One of the most important of these cases is that brought by the Snake Creek Mining and Tunnel Company against the Midway Irrigation Company, appealed from the Circuit Court of Appeals of the 8th District, in which a brief has been filed by the American Mining Congress. The issue in this case involves percolating waters.

The following is a list of other mining cases pending before the court:

Secretary of the Interior and Choctaw Nation vs. McAllister Edwards Coal Co., from the District of Columbia Court of Appeals.

L. Vogelstein & Co. vs. the U. S., from the Court of Claims, involving copper prices during the war.

George E. Vandenburgh vs. Truscon Steel Co., Circuit Court of Appeals, 6th Circuit.

Wells-Elkhorn Coal Co. vs. Otis Steel Co., District Court for the Eastern District of Kentucky.

American Steel Foundries Co. vs. Commissioner of Patents and Simplex Electric Heating Co., Northern Illinois District Court.

Altitude Oil Co. vs. Colorado, Colorado Supreme Court.

J. M. MacDonald Coal Mining Co. vs. the U. S., Court of Claims.

U. S. vs. New River Collieries Co., Circuit Court of Appeals, 2d Circuit.

O'Gara Coal Co. vs. Chicago Title and Trust Co., Circuit Court of Appeals, 7th Circuit.

H. P. Reed vs. Village of Hibbing, Minn., Minnesota Supreme Court, involving the extension of ore mining in that village.

Southern Utah Mines & Smelters vs. Beaver County, Utah District Court.

Exchange Oil Company vs. State Auditor of Oklahoma, from the Western District of Oklahoma.

Corona Coal Company vs. the Southern Railway, Northern Alabama District Court.

Hillsboro Coal Company vs. U. S. District Attorney, Southern Illinois District Court.

Brewer-Elliott Oil & Gas Company vs. U. S. Circuit Court of Appeals, 8th Circuit.

Liberty Oil Company vs. Condon National Bank and Atlas Petroleum Company Circuit Court of Appeals, 8th Circuit.

Colonial Beach Company vs. Quemahoning Coal Co., Circuit Court of Appeals, 4th Circuit.

St. Louis, Malleable Casting Company vs. George G. Prendergast Construction Company, Missouri Supreme Court.

U. S. vs. Producers Oil Co. and Texas Co., Circuit Court of Appeals, 5th Circuit.

U. S. vs. Gulf Refining Company of Louisiana, Circuit Court of Appeals, 5th Circuit.

U. S. vs. Southwestern Gas & Electric and Caddo Oil & Gas Company, Circuit Court of Appeals, 5th Circuit.

U. S. vs. Louisiana Oil Refining Company, Circuit Court of Appeals, 5th Circuit.

Federal Trade Commission vs. Sinclair Refining Company, Circuit Court of Appeals, 7th Circuit.

Porto Rico Coal Co. vs. W. H. Edwards, Collector District Court for the Southern District of New York.

Concrete Steel Company vs. George E. Vandenberg, Circuit Court of Appeals, 2nd Circuit.

Crown Dye and Tool Company vs. Nye Tool and Machinery Works, Circuit Court of Appeals, 7th Circuit.

Trustees of the U. S.-Mexico Oil Co. vs. T. W. Harris, Kansas Supreme Court.

Department of Commerce of Ohio vs. Cleveland Refining Co., Southern Ohio District Court.

G. F. WILLIAMS SUCCUMBS

GARDNER F. WILLIAMS, widely known mining engineer who was a prominent figure in the mineral development of South Africa, died August 15, at the residence of his daughter in Washington, D. C., following an illness of almost a year's duration.

Mr. Williams long was accepted as an authority on mining, both because of his many years of participation in the industry's activities and through the several books he wrote on the subject.

Following his development work in South Africa, where he was in charge of the mines in northern Transvaal, he was general manager of the DeBeers Company.

INTENSIVE RESEARCH PROGRAM OUTLINED FOR LOW-GRADE ORE STUDIES

AN INCREASING necessity that attention be devoted to development of methods for commercial utilization of low-grade ores of the United States is cronfronting the mining industry. This necessity is growing at a pace equal to that with which the higher grade mineral resources of the country are being depleted. This situation recently was outlined by D. A. Lyon, superintendent of experiment stations of the Bureau of Mines, in an address delivered for the mining committee of the Commercial Club, Salt Lake, in which he emphasized the importance of research work to meet the imperative demand of the future that the most economical means of handling extremely low-grade mineral bodies should be evolved.

The bureau, however, in entering upon and continuing its efforts to evolve these processes stresses the fact that in so doing it does not intend to enter into competition with private assaying and engineering problems, said Dr. Lyon. The bureau can only undertake its work along these lines when the problem at hand involves cases where conservation of large deposits are to be the subjects of study. If, however, any single company's problem is of such a character as to furnish in its solution benefits to any entire district or group of operators the bureau's policy permits it to engage in the investigation.

COLD-WATER THAWING TESTS ARE SUBJECT OF REPORT

INFORMATION REGARDING the use of water at natural temperatures in the thawing of frozen gravel in placer mining operations is given in a bulletin just published by the Bureau of Mines.

Experiments in cold-water thawing demonstrate that under favorable conditions the process is an assured success. It is proving of great value to the gold-mining industry of Alaska and the Yukon Territory and is encouraging investigation and exploitation of areas of frozen gravel that had been considered of too low grade for profitable mining.

In placer mining in the far North one of the greatest difficulties encountered is a permanently frozen condition of the ground.

In all, many millions of cubic yards of frozen ground have been mined in the northern fields of Alaska and the Yukon Territory, as well as Siberia, by using various methods to soften or thaw the gravel.

About 1915 to 1917, different persons started experiments on an entirely new plan for thawing the frozen gravel. Water at the natural summer temperature was applied by drilling holes through the frozen muck and gravel to bed-rock and the water was allowed to find its way through the gravel back to the surface. This water was taken from surface ditches, or through pipes under pressure, or pressure was obtained by pumping. The results of these tests were very satisfactory.

Although there is still much to be learned regarding practical application of the method, thawing with cold water has passed the experimental stage and is being proved of great value to the gold-mining industry.

NEW PLAN IN SELECTION OF U. S. MINING ENGINEERS

INVESTIGATIVE work of the Bureau of Mines soon will feel the benefits coming from adoption of a new policy by the Civil Service Commission in its selection of mining engineers to carry on the research activities of the government agency.

The commission has announced that examinations for positions with the bureau as mining engineers, associate mining engineers, and assistant mining engineers will be kept open at all times so that those desiring to enter the competitive tests for these places may be able to secure action upon their applications without delay. Previously, the examinations have been held at stated times and for the selection of engineers for certain stipulated kinds of work. Engineers whose individual qualifications did not adapt them to the work covered by the tests were forced either to give up the thought of association with the bureau or wait until more favorable tests were opened. Under the new policy, applicants may at any time make application for examination in at least one of the following optional branches: coal mining, engineer, metal mining engineer, nonmetallic mining engineer, and engineer in some specialized line of mining not included in any of these three classes.

In addition to these advantages which the new policy will hold for applicants and for the bureau in its selection of the personnel of its engineering staff, it is being pointed out that higher salaries than have been allowed for mining engineers will be available, and thus will men of the greatest talents be drawn into the service of the bureau.

The commission's announcement places salaries of mining engineers at $3,600 or over; associate mining engineers, $3,000 to $3,600; assistant mining engineers, $2,160 to $3,000.

GASOLINE SHOWS INCREASE IN OUTPUT AND USE

FIGURES FURNISHED the Bureau of Mines by refiners for the first six months of 1922 show an increase of 9.9 percent in domestic production of gasoline as compared with a similar period in 1921. The increase in domestic consumption is 6.1 percent in excess of this amount or 16 percent. Gasoline stocks at refineries in the United States July 1 registered a slight decrease from the figures for the previous month, according to statistics compiled by the Bureau of Mines, which show 824,966,456 gallons on hand. This is a decline of approximately 32,000,000 gallons from the figures for June 1, reflecting the normal seasonal drop due to increased use of automobiles in the summer months.

MINE OPERATORS IN MEXICO FORM ASSOCIATION

THE UNITED STATES Government has been officially advised of the forming by mine operators in Mexico of an association intended "to study proposed legislation likely to affect the mining industry, to collect vital mining statistics, and to disseminate pertinent information among its members." Details of the organization of the association are included in a report sent to the Department of Commerce by Consul James B. Stewart from Chihuahua.

"At the present time the membership of the association, which was formed under the name of Camara Minera del Estado de Chihuahua, is composed of two Mexican, three British and twelve American companies," says the report. "It is estimated that the combined investment of these companies in the States approximates $75,000,000 United States currency. The need of an association for the protection and betterment of the mining industry as a whole has long been felt. Through it the mine operators will be in a position to cooperate as a unit with the Mexican State and federal authorities."

HEALTH REPORTS—The health activities of the United States Bureau of Mines are described in a report recently issued by the National Health Council of Washington, D. C. This report outlines the history and development of the bureau, its legal authority, organization, personnel, appropriations and cooperation with other agencies. The report is the ninth in a series concerning those activities of the U. S. Government which deal directly or indirectly with the public health.

1,421,496—*J. Klewanech,* Royalton, Ill., July 4, 1922.

MINE FIREFIGHTING APPARATUS comprising an electrically driven car to which is coupled a tank car, various leads of hose being connected thereto, the front of the car provided with a nozzle directed forwardly, thereby providing means as the car moves into the tunnel of the mine, the water will be directed on the fire therein.

1,421,534—*J. Muller,* Berlin, Germany, July 4, 1922.

WORM DRIVE for electric mine locomotives in which the motor is supported beyond the wheel base in line with the worm gear and in the longitudinal axis of the car. The construction is particularly advantageous for two-axle locomotives, especially mine locomotives which must be short in construction, but can also find advantageous application in cars having three or more axles.

1,421,557—*T. E. Pray,* Chicago, Ill., July 4, 1922. Assigned to Goodman Mfg. Co.

SUPPORT FOR MINING MACHINES of the class adapted to be run laterally along the mine wall to cut a horizontal kerf in a plane above the mine floor somewhat higher than the normal plane of cutting machines.

1,421,585—*J. E. Sheridan* and *G. G. Griswold,* July 4, 1922.

FLOTATION PROCESS adapted to ores containing lead sulphide and one or more other metallic sulphides, including iron sulphide, which comprises treating the ore with a cyanide and an alkaline salt, and subjecting the thus treated ore to the flotation operation whereby the lead sulphide in large part is recovered in the resulting froth and the flotation of the iron sulphide is in large part inhibited.

1,421,706—*R. A. Mills,* Sand Spring, Md., July 4, 1922.

PROCESS FOR EXCLUDING WATER FROM OIL AND GAS WELLS which consists in introducing into a well or other rock cavity rock forming material and reagents adapted to react chemically with the dissolved constituents of natural rock solutions to form a precipitate adapted to render said rock forming material substantially impervious.

1,421,862—*W. E. Trent,* Washington, July 4, 1922. Assigned to Trent Process Corporation.

FLOTATION PROCESS consisting in mixing with the mineral a hydrocarbon oil and a comminuted carbonaceous material, in agitating the mixture until the mineral comminuted carbonaceous material and liquid hydrocarbon agglomerate, substantially free from froth and in then separating the agglomerated mass from the water.

1,421,984—*F. Ondra,* Johannesburg, South Africa, July 4, 1922. Assigned to Concentrators, Ltd.

HYDRAULIC CONCENTRATION which consists in first causing the particles to be mixed with a fluid under pressure and to be projected by such pressure in a stream following an uninterrupted path inclined at an angle to the vertical; collecting the particles as they fall due to their weight from said stream in prearranged zones to obtain a plurality of collection of particles each containing both gangue and mineral particles of substantially the same weight but varying as to size; and then separating the particles according to size to separate the mineral from the gangue particles.

1,422,386—*E. B. Starr* and *H. E. Marsh,* of Lompoc, Calif., July 11, 1922.

APPARATUS FOR SAWING NATURAL DEPOSITS by cutting grooves or kerfs in kiesel-guhr or similar material, comprising a cutter bar pivotally mounted on said supporting means and having a rearward extension on the opposite side of its pivotal mounting and serving as a lever for operating said cutter bar and provided with a handle and with means for locking the cutter bar in adjusted position, a cutter chain carried by and movably mounted on said cutter bar, and means for driving said cutter chain.

1,422,264, 1,422,265—*A. L. Hawksworth,* Butte, Mon., July 11, 1922.

DRILL having a detachable bit, with means for fastening the bit in such a way to insure its retention on the bar or shank while in service and yet permit instant removal of the bit when desired, the cutting edges of which will not all follow in the same path, thus increasing the speed of the cutting action; a water hole in the shank offset from that in the bit so as not to get flooded up with dirt or cuttings.

1,422,514—*H. A. Arbuckle,* Johannesburg, South Africa, July 11, 1922.

SEPARATING LIQUIDS AND SOLIDS comprising a settling vessel, and means for removing the settled solids therefrom, including a casing, which is in communication with the bottom of the vessel, a rod adapted to be reciprocated in said casing, and plates having openings and arranged upon and spaced apart along the length of said rod.

1,422,874—*H. Mack, Hamm,* Germany, July 18, 1922.

MINING COAL by means of a compressed gaseous fluid such as air, by introducing a suitable liquid, as, for instance, water or oil or the like, into bore hole first and thereafter the highly compressed gaseous fluid. As a result of this procedure the water penetrates into all the fissures and crevices of the coal bed in a similar manner as with the coal bed soaking method, and acts then as a tightening substance for the compressed gaseous fluid. Under such condition the effect of the forcing and expanding compressed air within the coal bed is especially great and any development of dust is suppressed in the beginning.

1,423,777—*V. F. Newman* and *M. W. Loomis,* July 25, 1922.

CONCENTRATING APPARATUS including a hydraulic concentrator for stratifying the material with the fines at the bottom and the middlings at the surface, said hydraulic concentrator having a tailings discharge; and means to wash the upper stratum of middlings from the stratified material.

1,423,877—*R. F. Phillips* and *L. J. McCloskey,* Pittsburgh, July 25, 1922. Assigned to Phillips Mine and Mill Supply Co.

WASHER FOR MINE CAR WHEELS.

1,424,114—*E. C. Morgan,* Morgan Park, Ill., July 25, 1922.

MINING MACHINE of the type which are drawn along the wall of a drift or tunnel while they are being continuously operated and the primary object is to provide an improved cooperating arrangement between the cutting, breaking down and removing mechanism. Mechanism is provided for cutting a plurality of spaced-apart horizontal kerfs and a vertical kerf spaced back from the face of the mine wall to effect the cutting of columns or cores of coal in position to be acted upon by a plurality of superposed pick machines to break down the coal into the range of operation of the conveyor which is provided with a scooping receiving end adapted to travel in the plane of the lowermost horizontal kerf.

PENN STATE MINING SCHOOL HAS LARGE CLASS

THE SCHOOL of Mines of the Pennsylvania State College will give instruction to nearly 1,000 students during the coming year, according to an announcement recently made at that institution. During the last school year 800 miners and operators were given extension training by the college workers, while nearly 200 other students were in the regular residence courses in mining engineering, mining geology, and metallurgical engineering.

BUYER'S DIRECTORY

ACID, SULPHURIC
Irvington Smelting & Refining Works, Irvington, N. J.

AERIAL TRAMWAYS
American Steel & Wire Co., Chicago and New York.

AERIAL TRAMWAY CABLE
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

AIR COMPRESSORS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

ALTITUDE VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

AMALGAMATORS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

APPLIANCES, ENGINEERING
Lunkenheimer Co., Cincinnati, Ohio.

ARMATURES
General Electric Co., Schenectady, N. Y.

ASSAYERS
Pennsylvania Smelting Co., Pittsburgh, Pa.

AUTOMATIC CAR CAGERS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

AUTOMATIC COAL SKIP
Roberts & Schaefer Co., McCormick Bldg., Chicago, Ill.

AUTOMATIC (Mine Doors, Truck and Electric Switches)
American Mine Door Co., Canton, Ohio.

BAROMETERS
Taylor Instrument Companies, Rochester, N. Y.

BATTERY-CHARGING EQUIPMENT
General Electric Co., Schenectady, N. Y.

BELTING (Conveyor, Elevator, Transmission)
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

BELTING, SILENT CHAIN
Morse Chain Co., Ithaca, N. Y.

BINS (Coke and Coal)
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

BIT SHARPENERS
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., 11 Broadway, New York City.

BLASTING POWDER
Hercules Powder Co., 934 King St., Wilmington, Del.

BLASTING SUPPLIES
Atlas Powder Company, Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Hercules Powder Co., 934 King St., Wilmington, Del.

BLOWERS
General Electric Co., Schenectady, N. Y.

BLOWERS' CENTRIFUGAL
Ingersoll-Rand Co., 11 Broadway, New York City.

BOILER MOUNTINGS
Lunkenheimer Co., Cincinnati, Ohio.

BOILER STOP AND CHECK VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

BOILERS
Allis-Chalmers Mfg. Co., Milwaukee, Wis. (feed pump).

BOXES, JOURNAL
J. R. Fleming & Son Co., Inc., Scranton, Penna.

BREAKERS (Construction and Machinery)
Jeffrey Mfg. Co., Columbus, Ohio.
Vulcan Iron Works, Wilkes-Barre, Pa.
Wilmot Engineering Co., Hazleton, Pa.

BRIQUETTING MACHINERY
Jeffrey Mfg. Co., Columbus, Ohio.
Traylor Eng. & Mfg. Co., Allentown, Penna.

BUCKETS (Elevator)
Jeffrey Mfg. Co., Columbus, Ohio.

CABLES (Connectors and Guides)
American Mine Door Co., Canton, Ohio.

CABLEWAYS
Jeffrey Mfg. Co., Columbus, Ohio.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

CAGE (Safety Appliances)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

CAGES
Car-Dumper & Equipment Co., Chicago, Ill.
Connellsville Mfg. & Mine Supply Co., Connells ville, Pa.
Holmes & Bros., Robert, Inc., Danville, Ill.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

CAR CONTROL AND CAGE EQUIPMENT
Car-Dumper & Equipment Co., Chicago, Ill.

CAR DUMPS
Car-Dumper & Equipment Co., Chicago, Ill.

CAR AND CAR WHEELS
Hockensmith Mine Car Co., Penn Station, Pa.

CAR-HAULS
Car-Dumper & Equipment Co., Chicago, Ill.

CASTINGS
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
The Lunkenheimer Co., Cincinnati, Ohio.

CHAINS
Jeffrey Mfg. Co., Columbus, Ohio.
Morse Chain Co., Ithaca, N. Y.

CHAINS, AUTOMOBILE ENGINE
Morse Chain Co., Ithaca, N. Y.

CHAINS, DRIVE
Morse Chain Co., Ithaca, N. Y.

CHAINS, FRONT END
Morse Chain Co., Ithaca, N. Y.

CHAINS, OILING
Morse Chain Co., Ithaca, N. Y.

CHAINS, POWER TRANSMISSION
Morse Chain Co., Ithaca, N. Y.

CHAINS, SILENT (Rocker-Joint)
Morse Chain Co., Ithaca, N. Y.

CHAINS, SLING
Morse Chain Co., Ithaca, N. Y.

CHAINS, SPROCKET WHEEL
Morse Chain Co., Ithaca, N. Y.

CHEMICALS
Roessler & Hasslacher Chemical Co., 709-717 Sixth Avenue, New York.

CHEMISTS
Hunt, Robt., & Co., Insurance Exchange, Chicago, Ill.

CIRCUIT BREAKERS
General Electric Co., Schenectady, N. Y.

CLAMPS (Trolley)
Ohio Brass Co., Mansfield, Ohio.

CLUTCHES
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

COAL COMPANIES
Clinchfield Coal Corp., Dante, Va.
Lehigh Coal & Navigation Co., Philadelphia, Pa.
Stonega Coal & Coke Co., Philadelphia, Pa.
Thorne, Neale & Co., Philadelphia, Pa.
Wholesale Coal Co., Pittsburgh, Pa.

COAL CRUSHERS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., Columbus, Ohio.

COAL CUTTERS
Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, Ohio.

COAL DRYING PLANTS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COAL HANDLING MACHINERY
Jeffrey Mfg. Co., Columbus, Ohio.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COAL MINING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Goodman Mfg. Co., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.
Jeffrey Mfg. Co., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COAL MINE POWER PLANTS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COAL MINING PLANTS
Ingersoll-Rand Co., 11 Broadway, New York City.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COAL WASHING PLANTS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

COCKS (Locomotive, Cylinder and Gauge)
The Lunkenheimer Co., Cincinnati, Ohio.

COILS (Choke)
General Electric Co., Schenectady, N. Y.

COMPRESSORS, AIR
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

COMPRESSORS, MINE CAR
Ingersoll-Rand Co., 11 Broadway, New York City.

CONCENTRATORS (Table)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CONCRETE REINFORCEMENT
American Steel & Wire Co., Chicago and New York.

CONDENSERS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ingersoll-Rand Co., 11 Broadway, New York City.

CONSULTING ENGINEERS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

CONTRACTORS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

CONTROLLERS
General Electric Co., Schenectady, N. Y.
Goodman Manufacturing Co., Halsted St. and 48th Place, Chicago, Ill.

CONVERTERS, COPPER
Traylor Eng. & Mfg. Co., Allentown, Penna.

CONVEYORS, BELT
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

CONVEYORS, CHAIN FLIGHT
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Wilmot Engineering Co., Hazleton, Pa.

CONVEYORS, COAL
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

CONVEYORS AND ELEVATORS
Jeffrey Mfg. Co., Columbus, Ohio.

CONVEYORS, PAN OR APRON
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

CONVEYORS, SCREW
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

COPPER ELECTROLYTIC
United Metals Selling Co., 42 Broadway, New York City.

COPPER WIRE
Anaconda Copper Mining Co., 111 W. Washington St., Chicago, Ill.

CORE DRILLING
H. R. Ameling Prospecting Co., Rolla, Mo.
Hoffman Bros., Punxsutawney, Pa.

CRUSHERS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

CRUSHERS, COAL
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

CRUSHERS, JAW AND GYRATORY
Traylor Eng. & Mfg. Co., Allentown, Penna.

CRUSHING PLANTS, COKE
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

CYANIDE
American Cyanamid Co., New York, N. Y.
Roessler and Hasslacher Chemical Company, 709 Sixth Avenue, New York City.

DESIGNERS OF PLANTS
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

DIAMOND CORE DRILL CONTRACTING
H. R. Ameling Prospecting Co., Rolla, Mo.
Hoffman Bros, Punxsutawney, Pa.

DOORS, AUTOMATIC MINE
American Mine Door Co., Canton, Ohio.

DRAG LINES
Denver Rock Drill Mfg. Co., Denver, Colo.
Williamsport Wire Rope Co., Gen. Sales Office, 1301 Peoples Gas Bldg., Chicago, Ill.

DREDGES, GOLD AND TIN
New York Engineering Co., 2 Rector St., New York City.

DRIFTERS, DRILL
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., New York City.

DRILLS, AIR & STEAM
Ingersoll-Rand Co., 11 Broadway, New York City.

DRILLS (Blast Hole)
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., New York City.

DRILLS, CORE
H. R. Ameling Prospecting Co., Rolla, Mo.
Hoffman Bros., Punxsutawney, Pa.
Ingersoll-Rand Co., New York City.

DRILLS, ELECTRIC
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., New York City.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

DRILLS, HAMMER
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., New York City.

DRILLS (Hand Operated Coal)
Ohio Brass Co., Mansfield, Ohio.
Ingersoll-Rand Co., New York City.

DRILLS, PNEUMATIC
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., New York City.

DRILLS, PROSPECTING
H. R. Ameling Prospecting Co., Rolla, Mo.
Hoffman Bros., Punxsutawney, Pa.
Ingersoll-Rand Co., 11 Broadway, New York City.
New York Engineering Co., 2 Rector St., New York City.

DRILLS, ROCK
Denver Rock Drill Mfg. Co., Denver, Colo.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., New York City.

DRILL STEEL SHARPENERS
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRIVES, SILENT CHAIN
Morse Chain Co., Ithaca, N. Y.

DRUMS (Hoisting, Haulage)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

DRYERS, ORE
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

DUMPERS, ROTARY
Car-Dumper & Equipment Co., Chicago, Ill.

DUMP CARS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

DYNAMITE
Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Hercules Powder Co., 934 King St., Wilmington, Del.

DYNAMOS
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Forty-eighth Place and Halsted St., Chicago, Ill.

EJECTORS
The Lunkenheimer Co., Cincinnati, Ohio.

ELECTRICAL APPARATUS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

ELECTRICALLY OPERATED VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

ELECTRIC HOISTING MACHINERY
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

ELECTRIC LOCOMOTIVES
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Forty-eighth Place and Halsted St., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Ohio Brass Co., Mansfield, Ohio.

ELECTRIC MINE SUPPLIES
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

ELECTRICAL SUPPLIES
General Electric Co., Schenectady, N. Y.

ELEVATORS
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

ELEVATORS, BUCKET
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

ELEVATOR CABLES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

ELEVATOR MACHINERY
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

EMERGENCY TRIP VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

ENGINE STOP VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

ENGINE TRIMMINGS
The Lunkenheimer Co., Cincinnati, Ohio.

ENGINEERING APPLIANCES
The Lunkenheimer Co., Cincinnati, Ohio.

ENGINES
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

ENGINES, GAS AND GASOLINE
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

ENGINES (Hoisting and Hauling)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

ENGINES, OIL
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ingersoll-Rand, 11 Broadway, New York City

ENGINES, STEAM
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

ENGINEERS
H. R. Ameling Prospecting Co., Rolla, Mo.
Hunt, Robert & Co., Insurance Exchange, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

EXPLOSIVES
Atlas Powder Co., Wilmington, Del.
Du Pont Powder Co., Wilmington, Del.
Hercules Powder Co., 934 King St., Wilmington, Del.

FANS, VENTILATING
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Vulcan Iron Works, Wilkes-Barre, Pa.

FEEDERS, ALL TYPES
Traylor Eng. & Mfg. Co., Allentown, Penna.

FEEDERS, ORE
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

FILTERS (Water)
Wm. B. Scaife & Sons Co., Oakmont, Pa.

FLOTATION OILS
Hercules Powder Co., 934 King St., Wilmington, Del.

FLOW METERS
General Electric Co., Schenectady, N. Y.

FORGINGS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

FROGS AND SWITCHES
Central Frog & Switch Co., Cincinnati, Ohio.

FURNACES, MECHANICAL ROASTING
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

FURNACES, SMELTING
Traylor Eng. & Mfg. Co., Allentown, Penna.

GEARS
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., Columbus, Ohio.

GEARS, SILENT CHAIN
Morse Chain Co., Ithaca, N. Y.

GENERATORS AND GENERATING SETS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

GUY LINES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

HANGERS (Insulated Trolley)
Ohio Brass Co., Mansfield, Ohio.

HARDWARE
Wood Shovel & Tool Co., Piqua, O.

HEADLIGHTS, ARC AND INCANDESCENT
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

HOISTS, ELECTRIC
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.
Vulcan Iron Works, Wilkes-Barre, Pa.

HOISTS, PORTABLE
Ingersoll-Rand Co., 11 Broadway, New York City.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

HOISTS, STEAM
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Ingersoll-Rand Co., 11 Broadway, New York City.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.
Vulcan Iron Works, Wilkes-Barre, Pa.

HOISTS (Room & Gathering)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Holmes, Robert & Bros., Inc., Danville, Ill.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

HOISTING ROPES
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

HOSE, AIR & STEAM
Ingersoll-Rand Co., 11 Broadway, New York City.

HYDRAULIC MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Car-Dumper & Equipment Co., Chicago, Ill.
Traylor Eng. & Mfg. Co., Allentown, Penna.

HYDROMETERS
Taylor Instrument Companies, Rochester, N. Y.

HYGRODEIKS
Taylor Instrument Companies. Rochester, N. Y.

INDUSTRIAL HOUSING
General Electric Co., Schenectady, N. Y.

INJECTORS
The Lunkenheimer Co., Cincinnati, Ohio.

INSTRUMENTS, ELECTRICAL
General Electric Co., Schenectady, N. Y.

INSULATING MATERIAL, ELECTRIC
General Electric Co., Schenectady, N. Y.

INSULATING TAPE AND CLOTH
General Electric Co., Schenectady, N. Y.

INSULATORS, FEEDER WIRE
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

INSULATORS, SECTION
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

INSULATORS (Porcelain)
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

INSULATORS (Third Rail)
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

INSULATORS (Trolley)
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

INSULATED WIRE AND CABLE
American Steel & Wire Co., Chicago, Ill.
Roebling Sons, John A., Trenton, N. J.
Williamsport Wire Rope Co., Gen. Sales Office, 1301 Peoples Gas Bldg., Chicago, Ill.

JOURNAL BOXES
J. R. Fleming & Son Co., Inc., Scranton, Pa.

KILNS (Rotary)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

KILNS (Rotary Ore Nodulizers)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

LAMPS, ARC AND INCANDESCENT
General Electric Co., Schenectady, N. Y.

LAMPS (Carbon)
General Electric Co., Schenectady, N. Y.

LAMPS, ELECTRIC
General Electric Co., Schenectady, N. Y.

LEAD ORES
American Zinc, Lead & Smelting Co., 1012 Pierce Bldg., St. Louis, Mo.

LIGHTNING ARRESTERS
General Electric Co., Schenectady, N. Y.

LOADING BOOMS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

LOADING MACHINES
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

LOCOMOTIVE COALING STATIONS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

LOCOMOTIVES, ELECTRIC
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

LOCOMOTIVES, GASOLINE
Vulcan Iron Works, Wilkes-Barre, Pa.

LOCOMOTIVES, RACK RAIL
Goodman Mfg. Co., Chicago, Ill.

LOCOMOTIVES, STEAM
Vulcan Iron Works, Wilkes-Barre, Pa.

LOCOMOTIVES, STORAGE BATTERY
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

MACHINERY, TRANSMISSION (Power)
Morse Chain Co., Ithaca, N. Y.

MILLS, BALL, TUBE, ROD, COMBINATION
Traylor Eng. & Mfg. Co., Allentown, Penna.

MILLS, STAMP
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

MINE CAR TRUCKS
J. R. Fleming & Son Co., Inc., Scranton, Pa.

MINE DOORS, AUTOMATIC
American Mine Door Co., Canton, Ohio.

MINING CABLES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

MINING EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

MINING MACHINES
Goodman Mfg. Co., Forty-eighth Place and Halsted St., Chicago, Ill.

MINING MACHINES CHAIN AND PUNCHER
Goodman Mfg. Co., Forty-eighth Place and Halsted St., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

MINING MACHINES (Electric)
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

MINING MACHINERY
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., 11 Broadway, New York City.

MINING SHOVELS
Wood Shovel & Tool Co., Piqua, O.

MINE CAR HITCHINGS
Hockensmith Wheel & Mine Car Co., Penn Station, Pa.

MINE CAR TRUCKS
Hockensmith Wheel & Mine Car Co., Penn Station, Pa.

MINE SIGNALS
American Mine Door Co., Canton, Ohio.

MOTOR CONTROL APPARATUS
General Electric Co., Schenectady, N. Y.

MOTORS
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.

MOUNTINGS, BOILER
The Lunkenheimer Co., Cincinnati, Ohio.

NODULIZERS, ORE
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

NON-RETURN BOILER STOP VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

ORE, BUYERS AND SELLERS OF
Irvington Smelting & Refining Works, Irvington, N. J.
Phelps-Dodge Corporation, New York City.

PERFORATED METALS
Chicago Perforating Co., Chicago, Ill.

PERMISSIBLES, Explosives
Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Hercules Powder Co., Wilmington, Del.

PICKING TABLES
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

PIG LEAD
Pennsylvania Smelting Co., Pittsburgh, Pa.
United Metals Selling Co., 42 Broadway, New York City.

PIPE, CAST IRON
Hockensmith Mine Car Co., Penn Station, Pa.

PIPE, GENUINE WROUGHT IRON
A. M. Byers Co., Pittsburgh, Penna.

PIPE (Wood)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

PNEUMATIC TOOL
Ingersoll-Rand Co., 11 Broadway, New York City.

POWDER, BLASTING
Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Hercules Powder Co., 934 King St., Wilmington, Del.

POWER TRANSMISSION MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

PROSPECTIVE DRILLS
H. R. Ameling Prospecting Co., Rolla, Mo.
Hoffman Bros., Punxsutawney, Pa.
Ingersoll-Rand Co., 11 Broadway, New York City.

PULVERIZERS, COAL AND COKE
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

PUMPS, CENTRIFUGAL
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, AIR LIFT
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, MINE
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS (Electric)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

PUMPS (Gathering or Dip)
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

PUMPS, PNEUMATIC AIR LIFT
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, POWER
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, POWER DRIVEN TRIPLEX AND QUINTRIPLEX
Traylor Eng. & Mfg. Co., Allentown, Penna.

PUMPS, SAND
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, STEAM
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS, VACUUM
Ingersoll-Rand Co., 11 Broadway, New York City.

PYROMETERS
Taylor Instrument Companies, Rochester, N. Y.

QUARRYING MACHINERY
Ingersoll-Rand Co., 11 Broadway, New York City.

RAIL BONDS
American Steel & Wire Co., Chicago and New York.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

RAILWAY SCOOPS
Wood Shovel & Tool Co., Piqua, O.

RAILWAY SUPPLIES
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

REDUCING VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

REGULATING VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

RELIEF VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

REGULATORS, TEMPERATURE AND PRESSURE
Taylor Instrument Companies, Rochester, N. Y.

ROCK DRILLS
Denver Rock Drill Mfg. Co., Denver, Colo.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

RODS, COPPER, HOT ROLLED
Anaconda Copper Mining Co., Rolling Mills Dept., 111 W. Washington St., Chicago, Ill.

ROLLING MILL MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

ROLLS, CRUSHING
Traylor Eng. & Mfg. Co., Allentown, Penna.

ROPE, TRANSMISSION
American Steel & Wire Co., Chicago and New York.
Roebling Sons, John A., Trenton, N. J.
Williamsport Wire Rope Co., Gen. Sales Office, 1301 Peoples' Gas Bldg., Chicago, Ill.

ROPE, WIRE
American Steel & Wire Co., Chicago and New York.
Roebling Sons, John A., Trenton, N. J.
Williamsport Wire Rope Co., Gen. Sales Office, 1301 Peoples' Gas Bldg., Chicago, Ill.

ROTARY DUMPS
Car-Dumper & Equipment Co., Chicago, Ill.

SAFETY APPLIANCES, MINE
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

SCOOPS, RAILWAY
Wood Shovel & Tool Co., Piqua, O.

SCRAPER LOADERS
Goodman Manufacturing Co., Halsted St. and 48th Place, Chicago, Ill.

SCREENS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

SCREENS AND PERFORATED SHEETING
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Perforating Co., Chicago, Ill.
Holmes & Bros., Inc., Robert, Danville, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

SCREENS, REVOLVING
Chicago Perforating Co., Chicago, Ill.
Traylor Eng. & Mfg. Co., Allentown, Penna.

SEARCHLIGHTS
General Electric Co., Schenectady, N. Y.

SHARPENERS, DRILL
Ingersoll-Rand Co., 11 Broadway, New York City.

SHOVELS
Wood Shovel & Tool Co., Piqua, O.

SINKERS, ROCK DRILL
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., 11 Broadway, New York City.

SKIPS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

SMELTERS
Irvington Smelting & Refining Works, Irvington, N. J.

"SOLIDCAR" SELF-DUMPING CAGES
Car-Dumper & Equipment Co., Chicago, Ill.

SPLICE, CABLE
American Mine Door Co., Canton, Ohio.
Ohio Brass Co., Mansfield, Ohio.

SPLICE, INSULATOR
American Mine Door Co., Canton, Ohio.

SPLICE, TROLLEY WIRE
American Mine Door Co., Canton, Cincinnati, Ohio.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

SPROCKETS, COMPENSATING
Morse Chain Co., Ithaca, N. Y.

SPROCKETS, SILENT CHAIN
Morse Chain Co., Ithaca, N. Y.

SPROCKETS, SPRING
Morse Chain Co., Ithaca, N. Y.

STANDARD HOISTING CABLES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

STEAM REDUCING VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

STEAM TRAPS
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

STEEL, HOLLOW & SOLID DRILL
Ingersoll-Rand Co., 11 Broadway, New York City.

STEEL, REINFORCING
American Mine Door Co., Canton, Ohio.

STOP AND CHECK VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

STOPERS, ROCK DRILL
Denver Rock Drill Mfg. Co., Denver, Colo.
Ingersoll-Rand Co., 11 Broadway, New York City.

STORAGE BATTERIES, LOCOMOTIVES
General Electric Co., Schenectady, N. Y.
Ironton Engine Company, Ironton, Ohio.

STRAINER
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

SUSPENSION BRIDGE CABLES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

SWITCHBOARDS, POWER
General Electric Co., Schenectady, N. Y.

SWITCHBOARDS, TELEPHONE
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

SWITCHES (Disconnecting and Electric)
General Electric Co., Schenectady, N. Y.

SWITCHES, FROGS AND CROSSINGS
Central Frog & Switch Co., Cincinnati, Ohio.

SWITCHES AND FROGS, TROLLEY
American Mine Door Co., Canton, Ohio.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

SWITCHING CABLES
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

THERMOMETERS, ANGLE & STRAIGHT STEM
Taylor Instrument Companies, Rochester, N. Y.

THERMOMETERS, RECORDING & INDEX
Taylor Instrument Companies, Rochester, N. Y.

THROTTLE AND ENGINE STOP VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

TIPPLES
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

TIPPLE DESIGNERS
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

TIPPLE EQUIPMENT
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

TOOLS
Wood Shovel & Tool Co., Piqua, O.

TRACKS, PORTABLE, RAIL, ETC.
Central Frog & Switch Co., Cincinnati, Ohio.
West Virginia Rail Co., Huntington, W. Va.

TRAMWAYS
A. Leschen & Sons Rope Co., St. Louis, Mo.

TRANSFORMERS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

TRANSMISSION ROPE
Williamsport Wire Rope Co., 1301 Peoples Gas Bldg., Chicago, Ill.

TRANSMISSION, SILENT CHAIN
Morse Chain Co., Ithaca, N. Y.

TRAPS
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

TRIMMINGS, ENGINE
The Lunkenheimer Co., Cincinnati, Ohio.

TRIPLE ACTING NON-RETURN VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

TROLLEY FROGS
Central Frog & Switch Co., Johnstown, Pa.
Ohio Brass Co., Mansfield, Ohio.

TROLLEY (Hangers and Clamps)
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

TROLLEY MATERIAL, OVERHEAD
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

TROLLEY WHEELS AND HARPS
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

TROLLEY WIRE
Anaconda Copper Mining Co., Rolling Mills Dept., 111 W. Washington St., Chicago, Ill.

TRUCKS FOR MINE CARS
J. R. Fleming & Son Co., Inc., Scranton, Pa.

TURBINES, STEAM
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

VALVES
The Lunkenheimer Co., Cincinnati, Ohio.
Ohio Brass Co., Mansfield, Ohio.

VALVES, AUTOMATIC
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

WAGON LOADERS
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

WASHERIES
Roberts & Schaefer Co., Wrigley Bldg., Chicago, Ill.

WATER REGULATING VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

WATER RELIEF VALVE
Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Pa.

WATER SOFTENING AND PURIFYING APPARATUS
Wm. B. Scaife & Sons Co., Oakmont, Pa.

WELDING APPARATUS, ELECTRIC ARC
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio.

WHISTLES
The Lunkenheimer Co., Cincinnati, Ohio.

WIRE AND CABLE
American Steel & Wire Co., Chicago and New York.
Anaconda Copper Mining Co., Rolling Mills Dept., 111 W. Washington St., Chicago, Ill.
General Electric Co., Schenectady, N. Y.
Roebling Sons, The John A., Trenton, N. J.
Williamsport Wire Rope Co., Gen. Sale Office, 1301 Peoples Gas Bldg., Chicago, Ill.

WIRE ROPE
A. Leschen & Sons Rope Co., St. Louis, Mo.
Williamsport Wire Rope Co., Gen. Sales Office, 1301 Peoples Gas Bldg., Chicago, Ill.

WIRE ROPE FITTINGS
American Steel & Wire Co., Chicago and New York.
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Ventilation the Safety Factor In Mining

C. Lorimer Colburn, Mining Engineer, U. S. Bureau of Mines, in his article on page 53 of the March 30th issue of Coal Age, says!

"An operator has not done everything in his power to make his mine safe if he has neglected to install a positive system of ventilation, for it is not safe to depend on atmospheric conditions for supplying air to the mines.

"Many mines, especially the smaller ones, depend upon natural air currents for their ventilation, and are hazardous on account of lack of controlled ventilation.

"The laws of some states require two exits from a mine. When two openings to the surface are provided a flow of air is set up. This current may be beneficial or detrimental, depending on atmospheric conditions. A change in the atmospheric pressure may start a draft in the opposite direction from that desired.

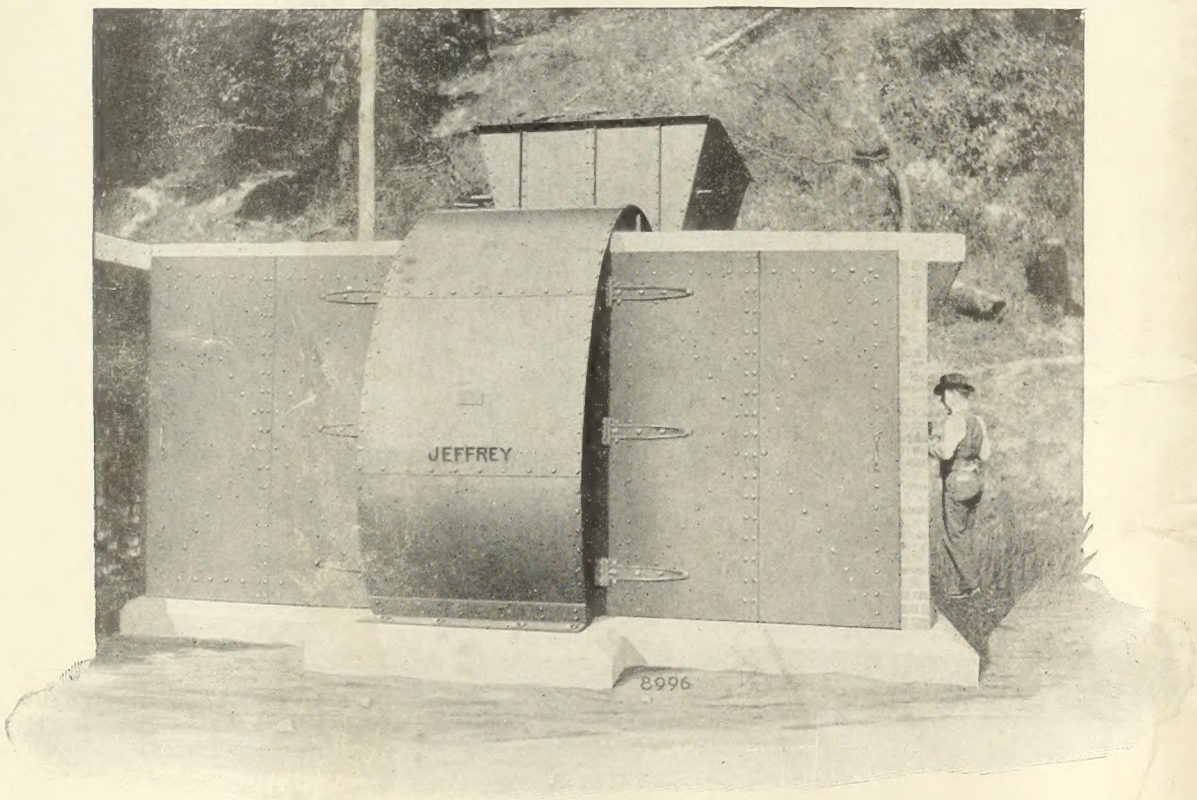
"Is it best to leave such an important contributor to mine safety as ventilation to the uncertainty of weather conditions, or is it best to install a fan and always keep the air through the property under control?"

All mines, large or small, coal or metal, should have positive ventilation. Jeffrey mine fans are built to meet every condition found in the mining field. Very frequently our Stepped Multi-Bladed Fan has paid for itself in one year's operation, because of its power saving factors and efficient ventilation.

Jeffrey Ventilation Engineers of wide experience are ready to assist you with your ventilation problems.

The Jeffrey Mfg. Co., Columbus, Ohio

958-99 North Fourth Street



8 ft. x 3 ft. x 6 in. Double Inlet Reversible Fan at the Essen Mine, Pittsburgh Coal Co., which produced the following results:

—Speed of Fan.....212 R. P. M.
—Water Gauge.....3 inches
—Volume Delivered.160,000 Cu. Ft.
—Input of Fan.....89.72 H. P.
—Output of Fan.....75.64 H. P.
Mechanical Efficiency.....84.3%
Manometric Efficiency.....81.6%
Volumetric Capacity.....431.0%

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